Construction Methods

APRIL 1946

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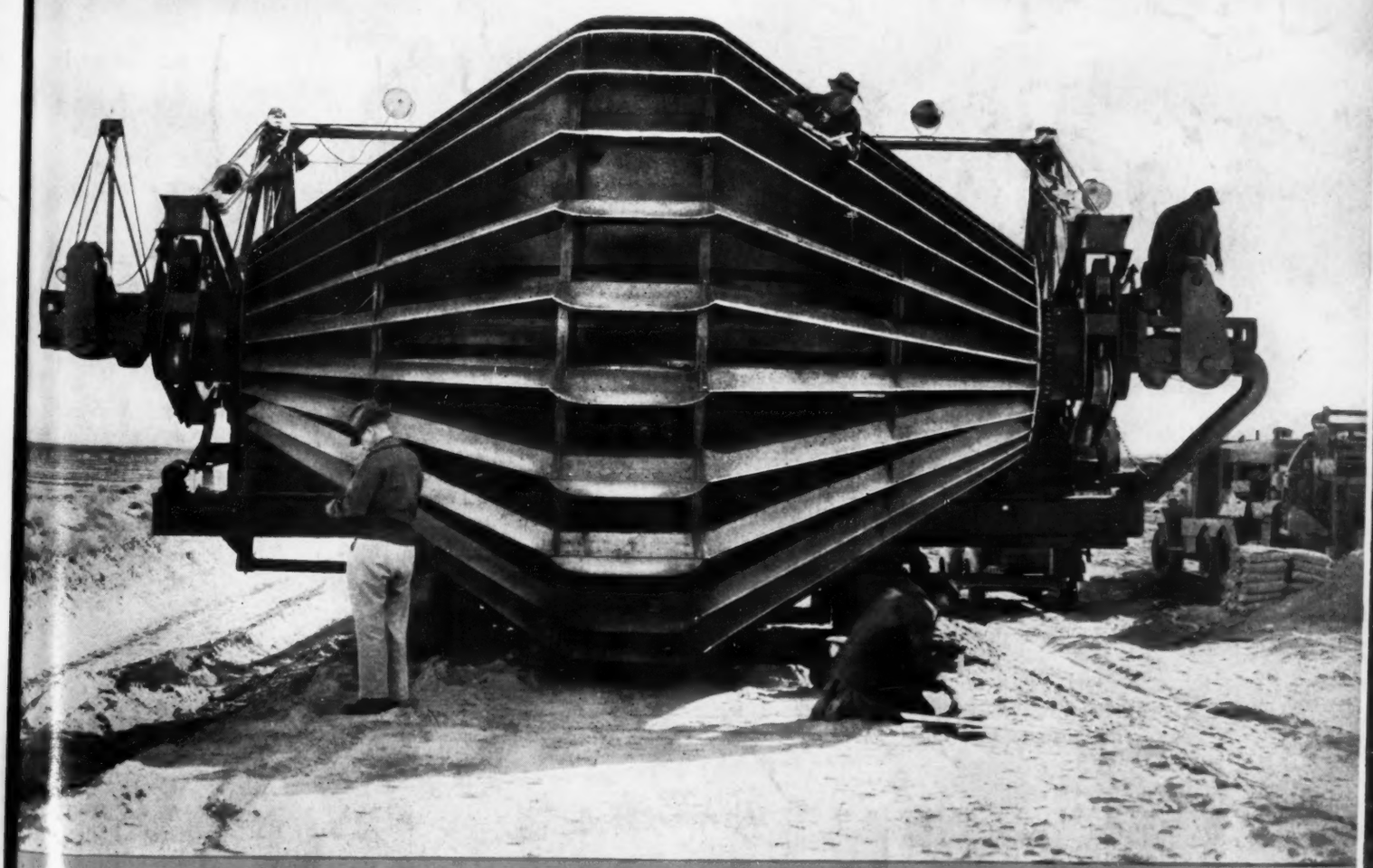
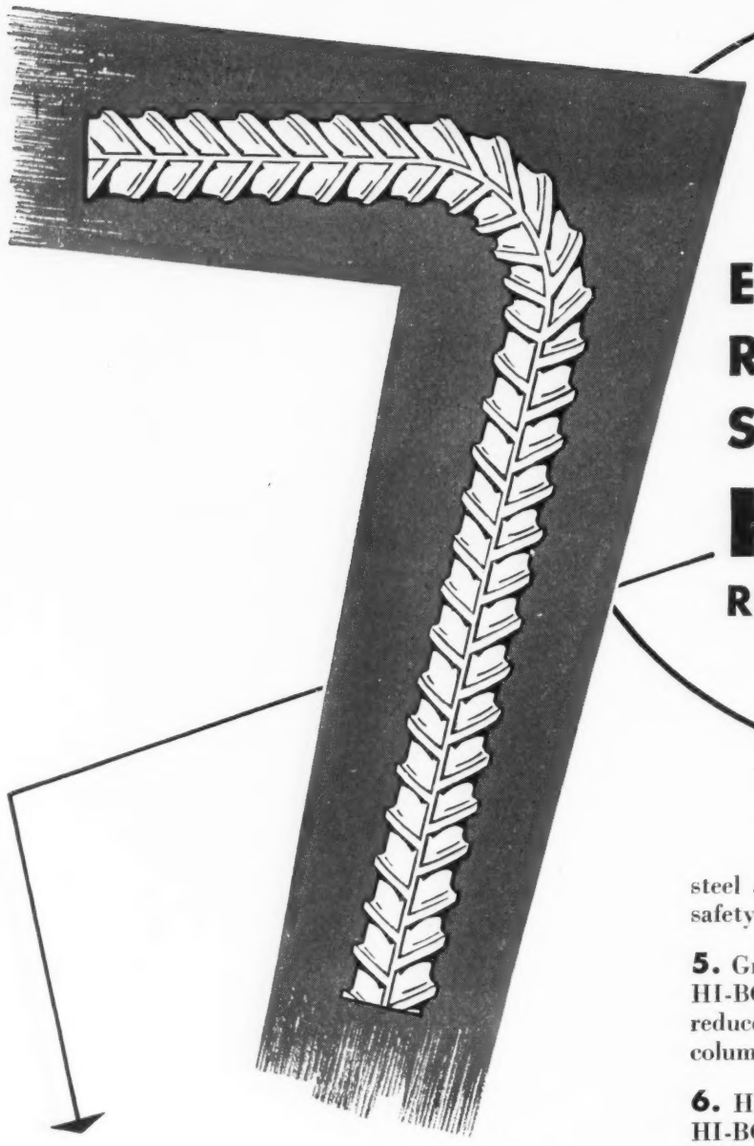
DETROIT

Excavator Cuts and Trims
Gila Project Canals
in One Operation



FINANCING CONSTRUCTION EQUIPMENT PURCHASES • CRANE BOOM STOPS AS SAFETY DEVICES
WELDED STEEL SHORING FOR HIGH BANK • TRAVELING FORMS ON DOUBLE BOX DRAIN
CONCRETE HOUSE-BUILDING MACHINE



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INLAND HI-BOND
CONCRETE REINFORCING BARS

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Construction Methods

A Pictorial Survey of Current Practice, Equipment and Materials

A. E. PAXTON, *Publisher*
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APRIL, 1946

Cuts and Fills

Dredge builders and operators were given something to dream, plan and worry about at Philadelphia recently when Army engineers representing The Panama Canal sprung a few details of what's involved in the proposed deepening of the canal to sea level. Staggering prospects of dredging 325 million yards of rock and 400 million yards of earth to 135-ft. depths made the dredgers a little groggy. That, me hearties, is *some* dirt-moving job. But we're betting that the construction industry will come up with new methods and equipment and take the job right in stride. The industry never has been licked, and deepening the Big Ditch is just another challenge to meet.

★ ★ ★

On second thought, maybe we won't need all that new dredging equipment for the job. As we enter the Atomic Age, how about applying explosive ditching to inter-ocean canal building? Simply drill a row of deep holes across the Isthmus, load 'em with atomic bombs, run everybody clear back to Mexico and let her go. Maybe no isthmus would be left, but we would have the two oceans hooked together.

★ ★ ★

Safety in construction pays dividends, both humanitarian and financial. Safety doesn't just happen, it's only accidents that happen. Safety is the result of constant vigilance, intelligent planning, sound education and common-sense operation. Starting with this issue, in which we cite Roy MacGregor for service in construction safety, each month we hope to present at least one safety feature, flagged with the symbol "Safety on the Job" to call it to your attention. The editors welcome contributed illustrated items on safe and unsafe practices. Each one accepted is worth a new hat or a couple of shirts when you can get them.

★ ★ ★

Houses parade across the construction screen as the government's curtailment order limits other types of building. It is a bizarre parade of machine-hatched concrete units, aluminum domes, prefabs new and reconverted, barracks moved across the nation to become apartments, factory ready-builts, quonsets, trailers, abandoned lighthouses and surplus ships. These all have a place in the housing emergency, but the real solution, practical builders point out, is apartment houses galore and large-scale developments, with the emphasis on rental properties rather than on individual ownership. Whatever the answer may be, let's get this housing job finished so we can get to work at the other needed building projects.

HERE'S HOW IN THIS ISSUE

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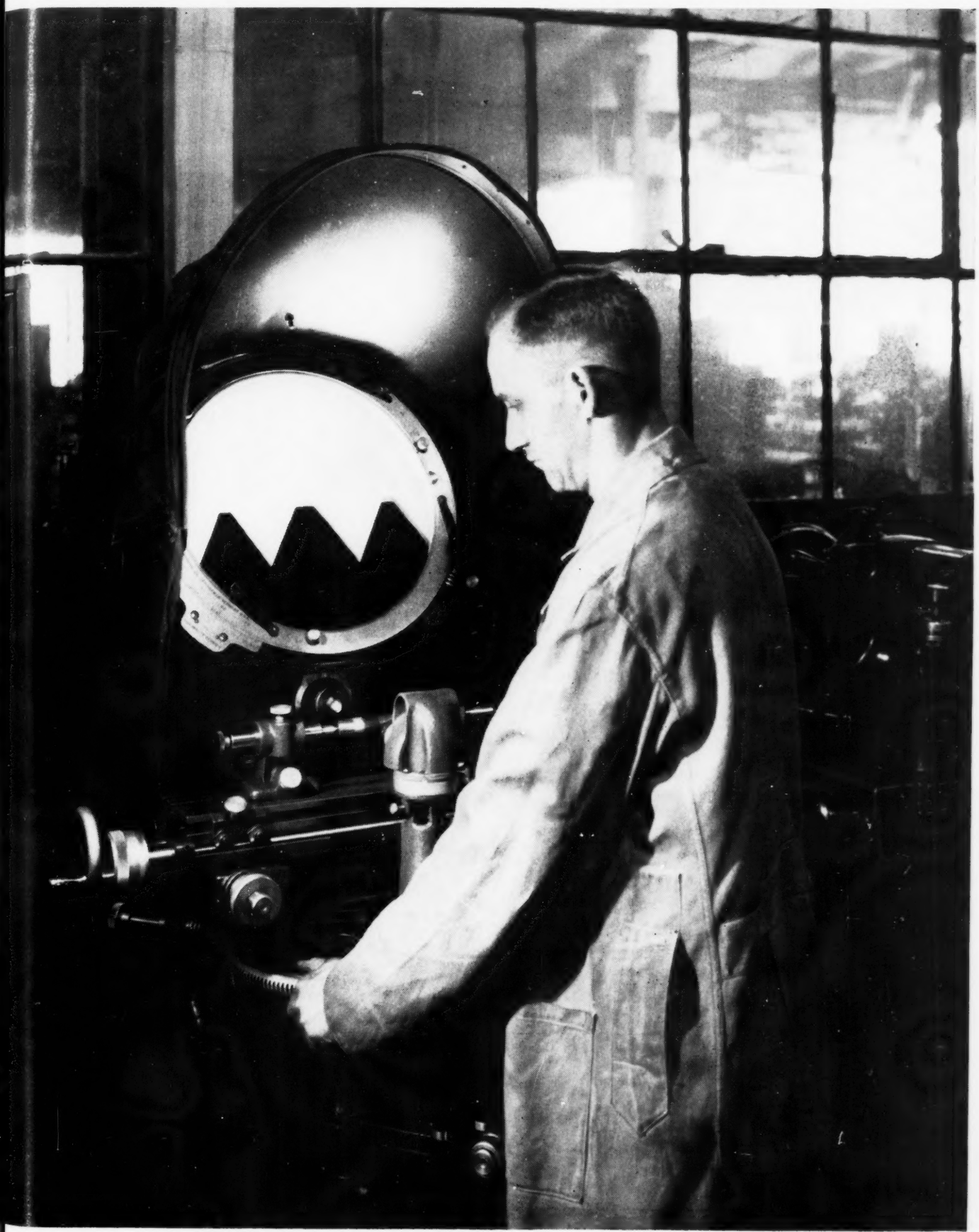


An optical comparator used to check gear thread profiles in the OLIVER "Cletrac" plant.

THE JOB JESTER

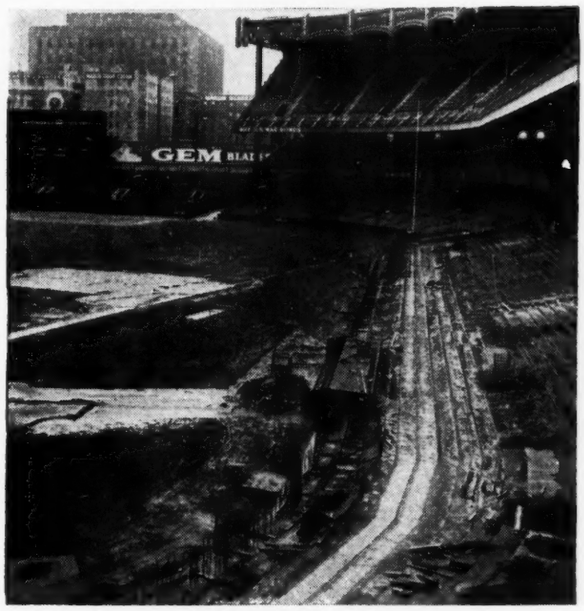
CARTOONS DRAWN FOR CONSTRUCTION METHODS

"You clumsy bum! Look what you're doing."

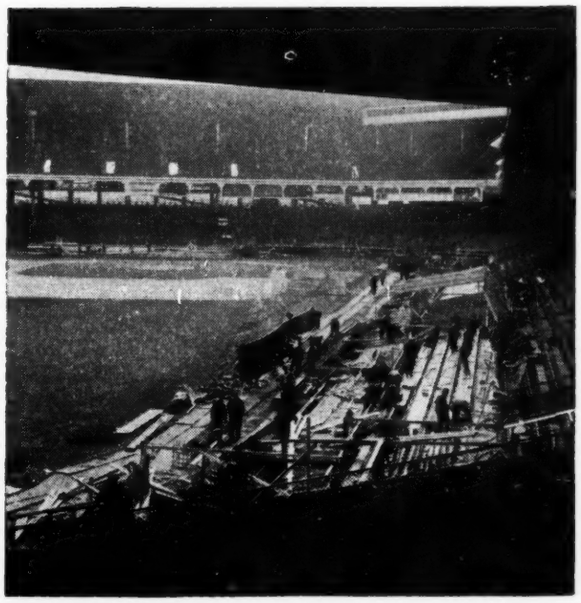
"Must be his first day."

"Where did you get this formula?"

'INCOR' IN THE BIG LEAGUES



Alterations at Yankee Stadium provide 5000 additional box seats and nearly 100 rooms at three levels under the right-field stand. Contractor R. L. Wirtz, Columbus, Ohio, used 5000 cu. yd. 'Incor' concrete. Engineers: Osborne Engineering Co., Cleveland, Ohio.



Brooklyn Dodgers have installed nearly 1000 additional box seats at Ebbets Field. 'Incor' helped Caisson & Foundation Corp., Bronx, N. Y., rush completion. Engineers: Hardesty & Hanover, New York City.

Fast Thorough Job-Curing Speeds Alterations in Time for Opening at Yanks' and Dodgers' Parks

IF HISTORY should repeat, with the New York Yankees and Brooklyn Dodgers meeting in the next world series, chances are you will be seated in a comfortable new box seat installed on 'Incor' concrete. For the Yanks and the Dodgers have just enlarged the box-seating capacity of their ball parks—and both jobs were rushed to completion with the help of 'Incor' 24-Hour Cement.

At Yankee Stadium, Contractor R. L. Wirtz, of Columbus, Ohio, used 5000 cu. yds. of 'Incor' concrete for 5000 additional box seats and also in building nearly 100 rooms at three floor levels under the right-field stand. Alterations at Ebbets Field have extended the grandstand to playing field level, providing nearly one thousand additional box seats. Caisson & Foundation Corp., Bronx, N. Y., were the Contractors. Dependable 'Incor' high early strength speeded completion for opening date and beat cold-weather hazards.

With today's greatly increased labor and material costs, TIME is more expensive than ever and 'Incor' time and money savings were never so great as they are right now. Plan new structures and alterations with 'Incor'* 24-Hour Cement—save 50% on forms, cut time and overhead, get earlier occupancy at less cost. *Reg. U. S. Pat. Off.

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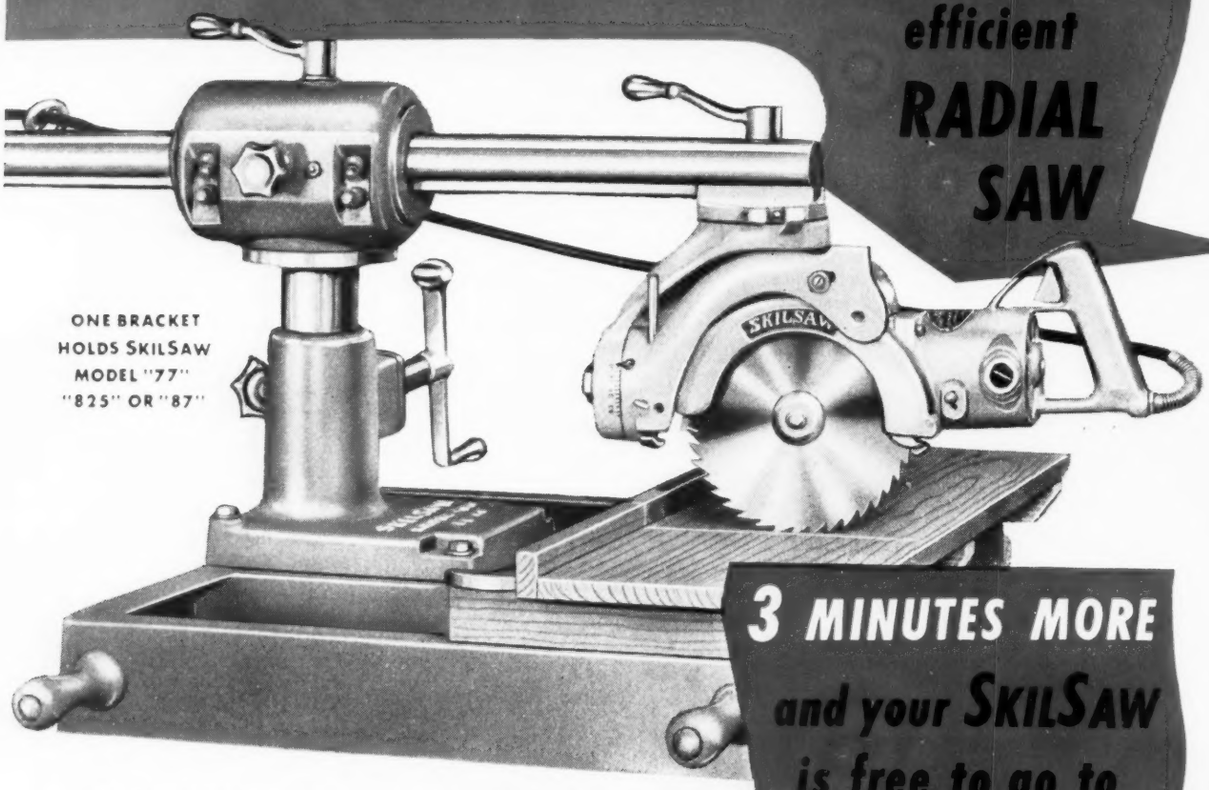

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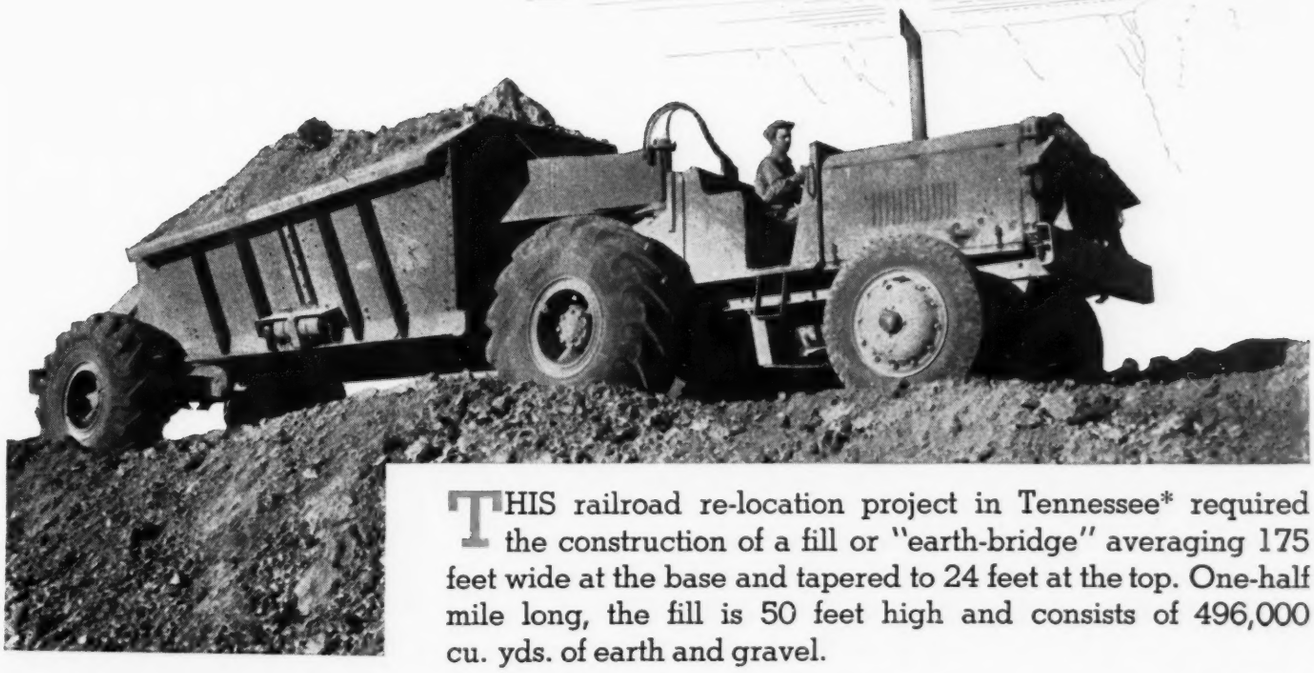

THIS railroad re-location project in Tennessee* required the construction of a fill or "earth-bridge" averaging 175 feet wide at the base and tapered to 24 feet at the top. One-half mile long, the fill is 50 feet high and consists of 496,000 cu. yds. of earth and gravel.

The Wolfe-Michael Co. used five Bottom-Dump Euclids of 13 yd. capacity which were loaded by a 1¾ cu. yd. shovel. Average speed of the Euclids for the 7,040 ft. haul was 12.5 m.p.h. including turns on fill and at the loading shovel.

Exceptional maneuverability and short turning radius of the Bottom-Dump Euclids were important on this job because of the close working quarters and narrow fill. Fast travel speed on the difficult haul road and the ability of Euclids to dump their loads quickly saved time and reduced hauling costs.

All Euclid models, Rear-Dump and Bottom-Dump, are designed and constructed for a single purpose — to move earth and other materials over off-the-highway hauls at lowest cost. Your Euclid distributor will be glad to provide information and specifications on the models best suited to your requirements.

*Part of the improvement program of the Nashville, Chattanooga and St. Louis R. R. near Dickson, Tennessee, west of Nashville.

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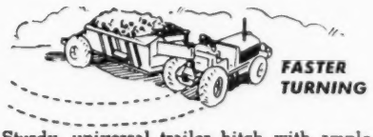
BOTTOM-DUMP EUCLID ADVANTAGES



Sturdy, universal trailer hitch with ample clearance for hopper and doors.

Steep, smooth sides of the trailer and unobstructed door openings full length and width — control for opening and closing the doors is conveniently located on the steering column.

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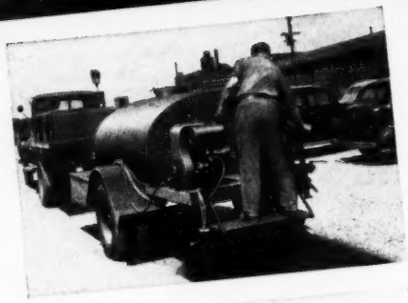
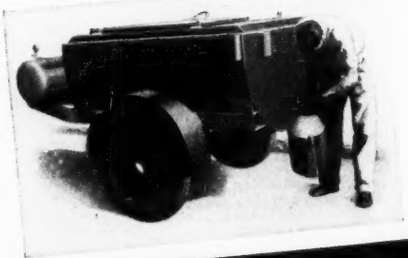


TAR KETTLES

Equipped with trailer equipment for fast and easy towing behind trucks. The powerful burner heats material to any desired temperature.



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It floats as it grips — it's built with greater bruise resistance

BUILDERS of roads, dams, airports, and others who have to work in soft dirt, sand, and loam had plenty of special tire problems. For instance, tires often mired, losing valuable time. Wheels would spin and tires might be cut by sharp rocks. And tires took a beating when they hit rocks and ruts —because every "hit" is an impact that often leads to bruises and blow-outs. Resulting delays and repairs eat into profits.

B. F. Goodrich engineers studied all the angles, and came up with a new kind of tire...the Super-Traction (shown above). First, they solved the "miring" problem with a special self-cleaning tread that has enlarged contact area to provide maximum flotation. The heavy cleats give a deep bite —without bogging down or slipping. The body is flexible but strong.

The other big problem—greater bruise resistance—was solved with a new kind of construction principle —the *shock shield*. This shield, an exclusive B. F. Goodrich feature, is a set of four breakers—layers of rubber-coated rayon cords—built in between the tread and the plies. The breakers are in pairs, with the cords in each pair running parallel to each other—but with each pair running in opposite directions to give balanced strength. The breakers are cushioned with thick layers of shock-resistant rubber.

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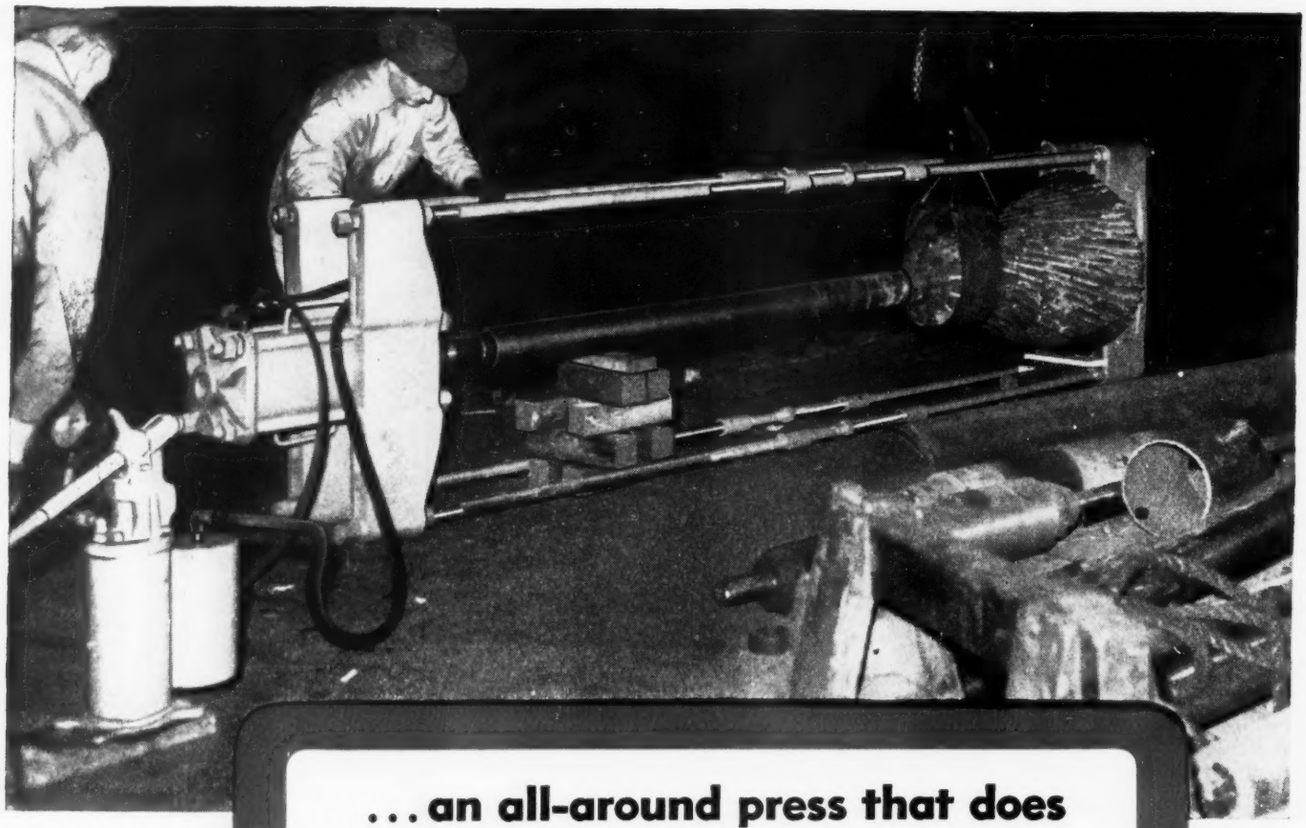

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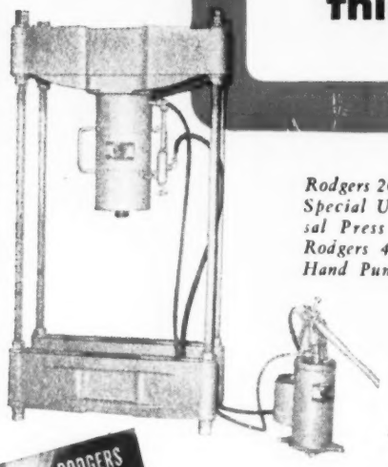

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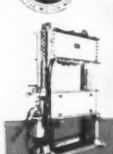

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Crawler-Track Presses

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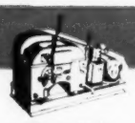

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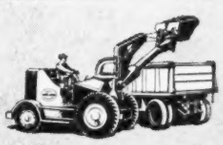

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"SPEEDLINE" Concrete Mixers

"SURE PRIME" Contractors Pumps

JAEGER *Engineered* **EQUIPMENT**

JAEGER-LAKEWOOD SPREADERS, FINISHERS AND BITUMINOUS PAVERS, FORMS, FORM TAMPERS—"DUAL-MIX" TRUCK MIXERS, AGITATORS—JAEGER HOISTING ENGINES, TOWERS

Red Lead "Soaps"

help make Paint Film Tough...Flexible...Water-Resistant

While maintenance engineers know, by long experience, that Red Lead helps *make metal last* . . . and widely accept it as the standard metal protective paint . . . it remained for modern science to show exactly *why* Red Lead so effectively inhibits rust.

One of the important reasons is Red Lead's ability to react with the vehicle, and produce unique lead "soaps."

These soaps grow to form a tough, impervious, intermeshing matrix within the paint film, as shown in the photomicrograph at right.

The soap formations increase Red Lead's protective power in several ways. For one thing, they *mechanically* reinforce and toughen the paint film.

At the same time they contribute all-important flexibility, allowing movement all along their soft, intertwining projections. This helps prevent the ruptures to which a hard unyielding film is subject.

Moreover, lead soaps slowly form primarily in the dry paint film as it ages. This is where the soap formations impart their greatest benefits. When a paint film weathers and ages, decomposition products of the vehicle are formed. Red Lead's ability to slowly combine with these decomposition products actually enhances the life of the paint film. Red Lead's slow rate of reaction means the film age-hardens at a slower rate. It thus retains a high degree of flexibility, a great factor in its lasting adhesion.

And again, the very structural formation of the soaps, with their dense, impermeable matrix of interwoven fibres, helps to restrict the passage of moisture through the paint film. Metal cannot rust without the presence of moisture.

Specify RED LEAD for ALL Metal Protective Paints

The value of Red Lead as a rust preventive is most fully realized in a paint where it is the only pigment used. However, its rust-resistant properties are so pronounced that it also improves any multiple pigment paint.

No matter what price you pay, you'll get a better paint for surface protection of metal if it contains Red Lead.

***This photomicrograph** shows the distinctive lead soap formations resulting from Red Lead's reaction with the vehicle. Note how the rod-like projections, radiating from central cores, spread out and intermesh. This makes a strong, flexible, interwoven structure, just as individual fibres in a piece of cloth are woven to make the cloth strong and durable. This type of soap formation is unique with lead paint films.*

***Here you see** the standard apparatus used for measuring the water permeability of paint films. With this equipment a measure of the amount of water that passes through a unit of film is obtained.*

Experiments show that a straight linseed oil film allows three times as much water to pass through the film as when the same film is pigmented with Red Lead . . . illustrating once more the beneficial protective action of Red Lead and Red Lead "soaps."

Write for New Booklet—"Red Lead in Corrosion Resistant Paints" is an up-to-date, authoritative guide for those responsible for specifying and formulating paint for structural iron and steel. It describes in detail the scientific reasons why Red Lead gives superior protection. It also includes typical specification formulas. If you haven't received your copy, address nearest branch listed below.

* * *

The benefit of our extensive experience with metal protective paints for both underwater and atmospheric use is available through our technical staff.

NATIONAL LEAD COMPANY: New York 6; Buffalo 3; Chicago 80; Cincinnati 3; Cleveland 13; St. Louis 1; San Francisco 10; Boston 6, (National Lead Co. of Mass.); Philadelphia 7, (John T. Lewis & Bros. Co.); Pittsburgh 30, (National Lead Co. of Pa.); Charleston 25, W. Va., (Evans Lead Division.)

Dutch Boy
Reg. U. S. Pat. Off.
Red Lead

You always get BLUE RIBBON PERFORMANCE WITH BLAW-KNOX BUCKETS

Good bucket performance means less time out for repairs and maintenance — constant pay loads on all kinds of digging and rehandling work — full utilization of crane capacities.

Catalog No. 1757 will show you how to select the exact bucket for your job. Send for it.

BLAW-KNOX DIVISION
OF BLAW-KNOX COMPANY

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NEW YORK • CHICAGO • PHILADELPHIA
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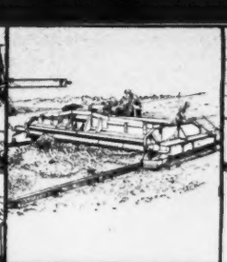
BLAW-KNOX CONSTRUCTION EQUIPMENT

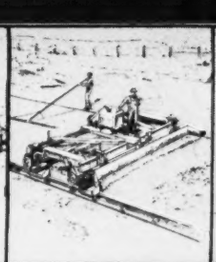
CONCRETE BUCKETS

TRUCK MIXER LOADING PLANTS

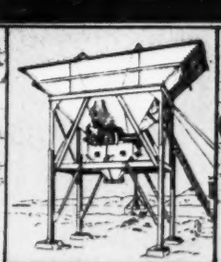
STEEL STREET FORMS



PAVING SPREADERS FOR ROADS AND AIRPORTS



FINISHING MACHINES FOR ROADS AND AIRPORTS

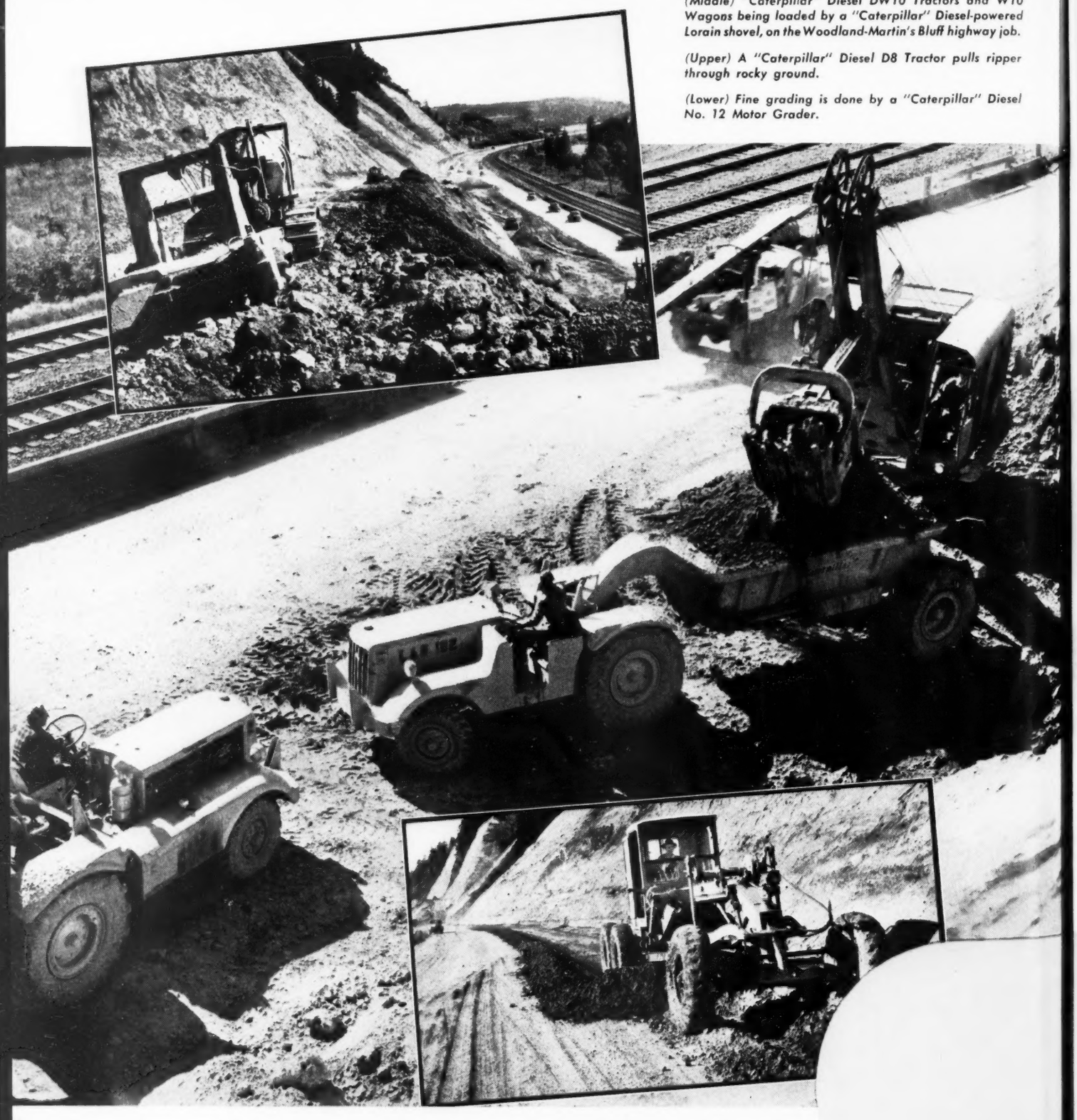


AGGREGATE BATCHING PLANTS

SHEEPSFOOT TAMPING ROLLERS

BULK CEMEN PLANTS

"CATERPILLAR" DIESEL



(Middle) "Caterpillar" Diesel DW10 Tractors and W10 Wagons being loaded by a "Caterpillar" Diesel-powered Lorain shovel, on the Woodland-Martin's Bluff highway job.

(Upper) A "Caterpillar" Diesel D8 Tractor pulls ripper through rocky ground.

(Lower) Fine grading is done by a "Caterpillar" Diesel No. 12 Motor Grader.

Zoned Equipment
MOVES EARTH AT A PROFIT

LEONARD & SLATE, Portland contractors, used the "Caterpillar" *zoned equipment* system on a recent highway widening job between Woodland and Martin's Bluff, Washington.

Husky "Caterpillar" Diesel Tractors—D8s and D7s—did the ripping and bulldozing. A "Caterpillar" Diesel-powered Lorain shovel loaded "Caterpillar" W10 Wagons, hauled to the fill by "Caterpillar" Diesel DW10 Tractors, rolling fast on rubber. And the fine grading was done by "Caterpillar" Diesel No. 12 Motor Graders. An all-round "Caterpillar" show.

It's being proved every day that most modern earthmoving jobs need *both* track-type and wheel tractors to move most yards in shortest time. Nothing can take the place of the D8 when it comes to tough 'dozing and scraper-loading work. But more and more owners are praising the speed, power, easy steering and excellent brakes of rubber-tired "Caterpillar" Diesel DW10 Tractors on the longer hauls and faster haul roads.

"Caterpillar" doesn't take sides. It builds *all* kinds of earthmoving machines—builds them with typical "Caterpillar" quality—to do the job at LOWEST COSTS ON EARTH.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

CATERPILLAR DIESEL

REG. U.S. PAT. OFF.

ENGINES • TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

THE DISCHARGED VETERAN WEARS THIS EMBLEM. REMEMBER HIS SERVICE AND HONOR HIM.

union-formed Is *Pre*formed

Ordinary wire rope is like a plump lady in a girdle. It is shaped by forcing the wires and strands to take the right shape as the rope is made. Remove the seizing wires and the parts fly out of shape.

Extra seizing on Union-formed wire rope is about as useless as a girdle on a shapely lady. That is because each wire is *pre*-formed into the helical shape it will take in the finished rope. Many pleasingly profitable advantages result. There are no internal stresses in Union-formed wire rope to cause it to kink, get cranky on the drum, start twisting in the sheave grooves, become fatigued from reverse bending or get as dangerous to handle as a porcupine when outer wires wear and break. These all add up to give you a wire rope that will run longer with less down-time. Specify *Union-formed—get the ultimate in low cost wire rope.*

ROAD SHOW BIGGEST EV

More To See Than At A 3 Ring Circus

Plans are shaping up now for the biggest ever Road Builders Show to be held early in 1947. Plan now to be there then. It will bring together the professional brains of the industry—Federal, State, County Officials — engineers, contractors and material men and the greatest display of plans and machinery ever assembled.

UNION WIRE ROPE CORPORATION
2174 Manchester **Kansas City 3, Missouri**

Add the undersigned to your mailing list to receive the series of 9 Rope Dope educational bulletins.

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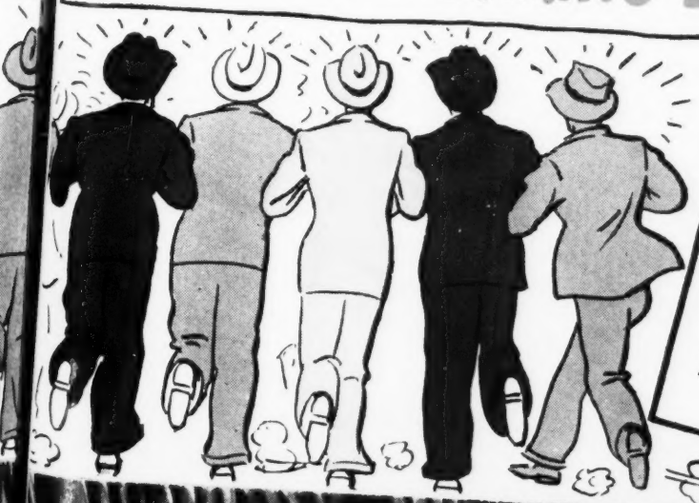
FREE... ROPE DOPE BULLETINS... GIVE YOU THE RIGHT DOPE ON THE SELECTION, CARE, HANDLING AND OPERATION OF YOUR WIRE ROPE—Here's a complete, easy to understand, interestingly written and illustrated course in getting the most out of your wire rope. Fill out and send the coupon above—Today. Get your name on the mailing list. The series of 9 Bulletins will be sent at frequent intervals—ALL at no cost—each will bring money-saving information. Send the coupon NOW.

ST EVER HELD -- COMING EARLY IN 1947



Plan Now To Be In On The Making Of A ROAD-UNITED STATES

All industry, all commerce, yea, every American has an economic stake in a *Road-United States*. Protect it against manhandling. Come! Improve your "know-how". Prepare to carry out your part of the road building program the competitive, cooperative American way.

23 MILES OF LOW COST LOADING

BY Athey FORCE-FEED LOADER

MOORE BROS., EAST ST. LOUIS, ILLINOIS, BUY ATHEY FORCE-FEED LOADER AFTER BRIEF DEMONSTRATION

When they contracted for 23 miles of shoulder and ditch repair work, Moore Brothers had planned on another method for loading excess material into trucks. An Athey Force-Feed Loader was driven to their job and demonstrated.

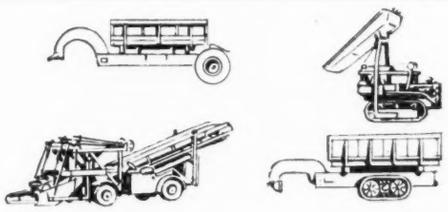
Following the demonstration Moore Brothers would not permit the Force-Feed Loader to leave their job. Working in conjunction with a "Caterpillar" Motor Grader, the Force-Feed Loader set a new record for loading windrowed material from shoulders... kept five 2-yard trucks constantly busy on a one mile haul... handling a mixture of sod and earth.

Your loading problems, too, can be solved... faster, more efficiently, at lowest cost... with the new, revolutionary Athey Force-Feed Loader. Get the story from your Athey-"Caterpillar" Dealer now!

ATHEY PRODUCTS CORPORATION, CHICAGO 38, ILL.

First step in this Illinois highway improvement job was grading shoulder and ditch with "Caterpillar" Motor Grader. Windrowed material was then loaded into truck by Athey Force-Feed Loader.

Athey APCOR Products **Athey**



Made for the job!

Snap-on IMPACT SOCKETS

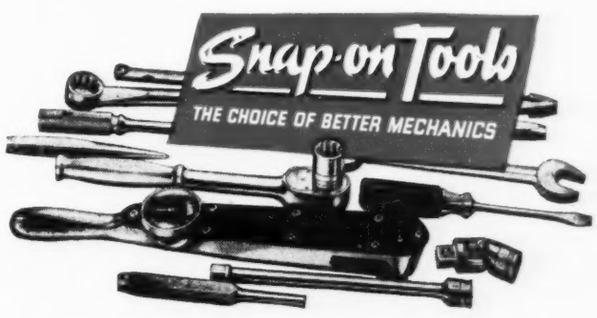
for all types of Impact Wrenches

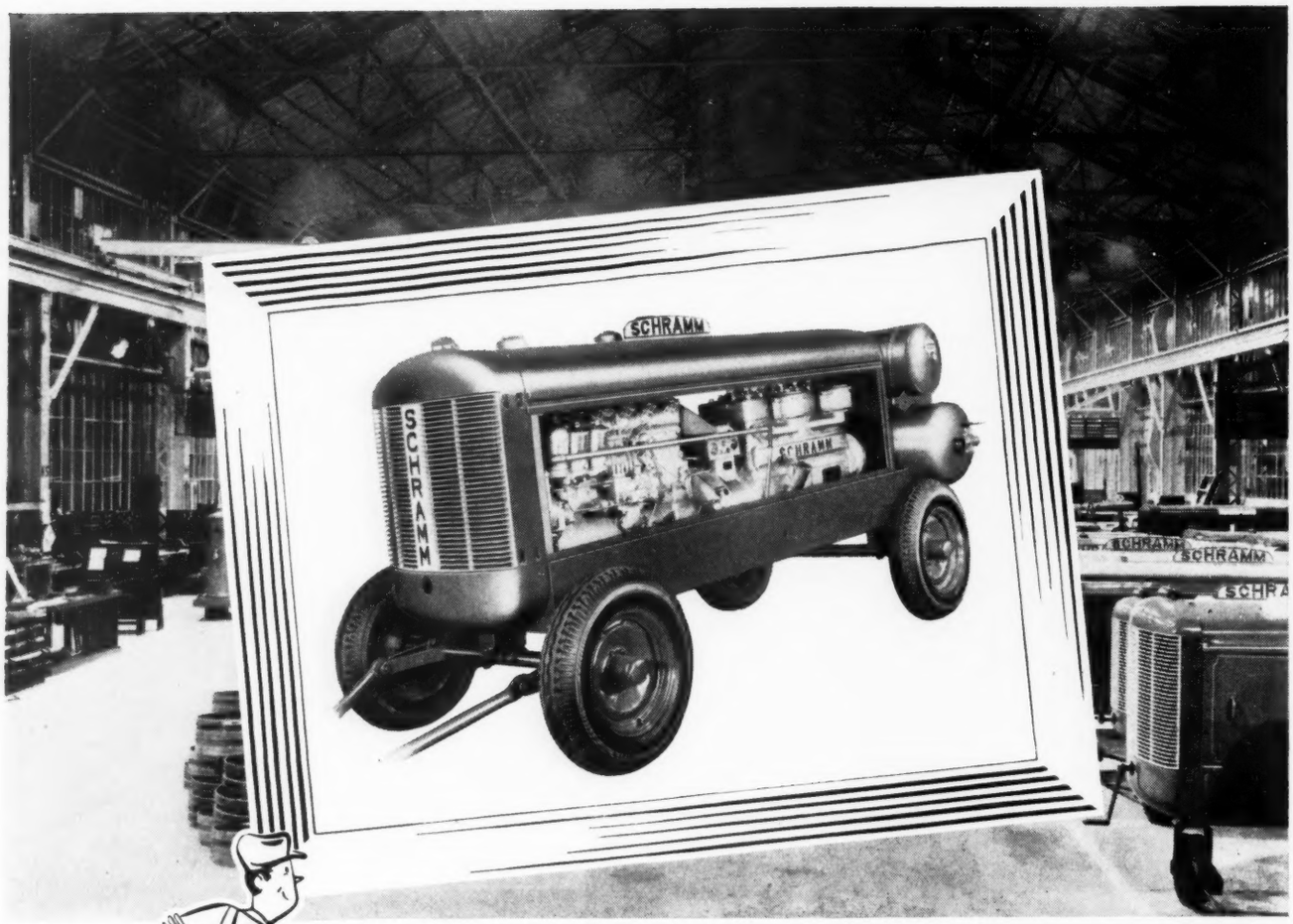
The constant, terrific pounding of powerful pneumatic impact drivers require sockets with rugged stamina far beyond that offered by ordinary sockets.

Snap-on impact sockets are *made for the job!* Special alloy steel and correct heat treatment provide utmost durability. Accurate fit and dependable locking devices contribute to speed and safety.

Snap-on impact sockets are widely used in manufacturing plants, railroad shops, ship yards, power plants . . . wherever top wrench performance is required. Available in 3/8", 1/2", 5/8", 3/4", 1" and 1 1/2" square drives with a full range of hexagon and square wrench sizes from 5/16" to 4 3/4" in standard length and bolt clearance types. Write for special catalog M46 describing the complete range of Snap-on impact sockets.

SNAP-ON TOOLS CORPORATION
8084-D 28th AVENUE KENOSHA, WISCONSIN





IN AIR COMPRESSORS...THERE ARE *Masterpieces, too*

Specialized workers make Schramm Air Compressors with that all-important "Know-How". So, when you get your Schramm Air Compressor you know you are not only getting a compressor with many exclusive features, but you know Schramm workers are assembling the features right, testing them thoroughly, and making a Masterpiece!

Schramm, with its enlarged facilities and modern plant at West Chester, produces on a large scale for industry. Schramm's expert workers and larger, modern facilities are geared to meet your needs for Air Compressors, both portable and stationary, in a wide range of sizes, for any requirements.

Today's features of Schramm Compressors are those that have stood up so well under the test of actual performance. These features include (1) 100% watercooled (2) mechanical intake valve (3) forced feed lubrication (4) push-button starting (5) compact and lightweight.

Post-war industry will find many uses for the versatile Schramm Air Compressor. We invite you to write today for our new catalog and become acquainted with the construction features and details of the many Schramm models.

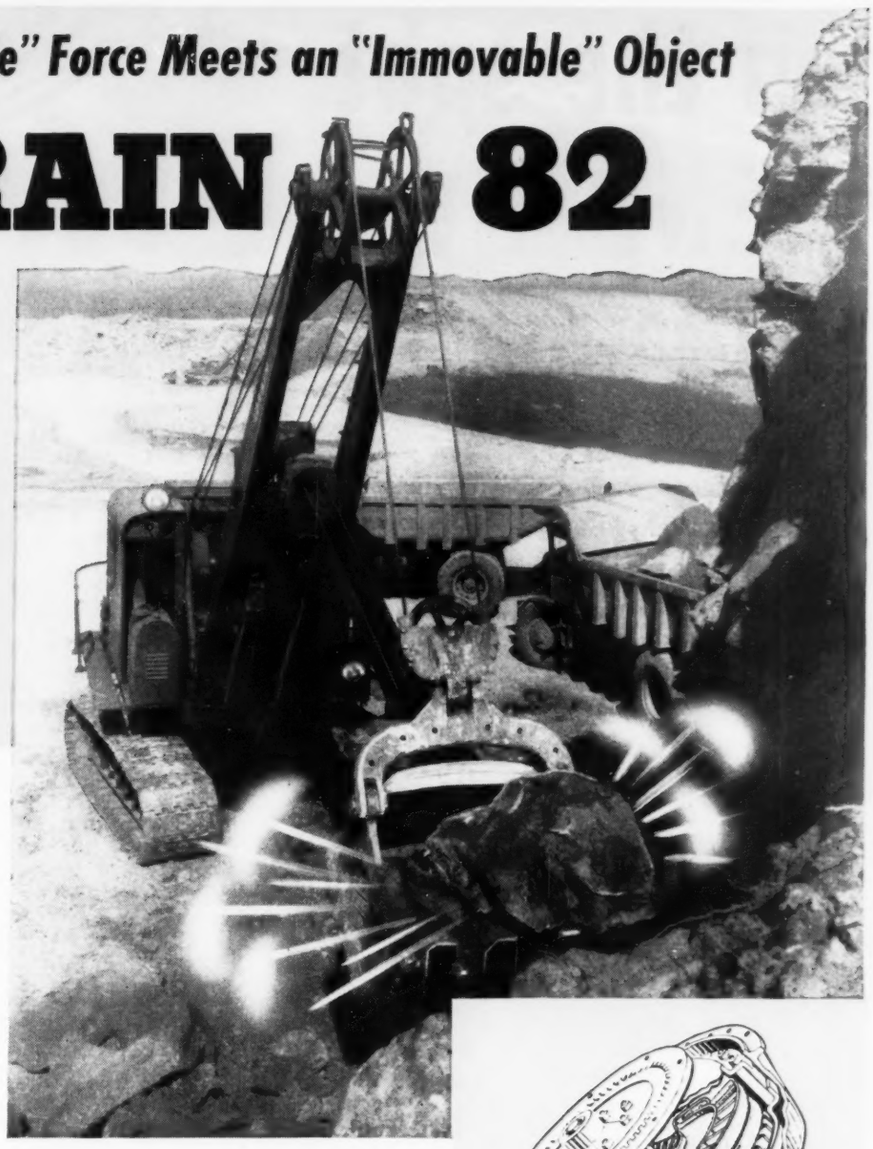
SCHRAMM INC.

THE COMPRESSOR PEOPLE
WEST CHESTER
PENNSYLVANIA

When an "Irresistible" Force Meets an "Immovable" Object

A LORAIN 82

"Rides with the Punch"



When the big dipper at the end of a powerful 2-yd. Lorain-82 slams into a big boulder or rigid rock strata, something is going to give. Usually it's the rock, but the terrific impacts and shocks can be mighty unhealthy to a shovel and its "innards".

A Lorain-82 Rock Shovel is engineered throughout to take these beatings. What's more, it cleverly "*rides with the punch*"!

Why? Because a hydraulic coupling (see diagram) acts as a shock absorber to cushion blows and shocks, to protect the cables, boom and power mechanism. Lorain engines can't stall in rock or any other digging! Their action is smooth as oil.

Your nearest Lorain distributor can explain the numerous mechanical advantages that insure the long life, low repair and maintenance cost, and the operating speeds which have made Lorains so predominant in brutal rock work.

Thew-Lorain was first with the Hydraulic Coupling which not only delivers tremendous digging power, but provides defense mechanism to cushion and absorb return wallops and strains.

Get the Facts and You'll Get a...

Reg. Trade Mark

thew-Lorain

CRANES • SHOVELS • DRAGLINES • MOTO-CRANES

on the spot BENDING

COLD

QUICK

ACCURATE

WITH THE W-S PORTABLE PIPE BENDER

THE Watson-Stillman Portable Hydraulic Pipe Bender will bend pipe or tubing up to 3 inches cold and right on the spot where it is needed.

Its open jaw construction permits the pipe to be inserted without removing bending dies or former. The work is in full view during the bending operation and the degree of bend can be checked at any point without removing pipe from the bender.

The bender is ruggedly constructed of forged steel, and the pump cylinder is made from seamless steel tube. It will bend all standard, extra strong and double extra strong steel pipe from 3/8" to 2" as well as standard weight pipe in 2½" and 3" sizes. Bending dies are supplied for each size of pipe.

WATSON-STILLMAN CO. • *Distributor Products Div.* • ROSELLE, NEW JERSEY

Sold only through distributors

Designers and Manufacturers of Forged Steel Fittings, Valves, Wire Rope Shears, Hand Pumps, Jacks, Pipe Benders and Hydraulic Equipment

WATSON-STILLMAN

DISTRIBUTOR PRODUCTS DIVISION

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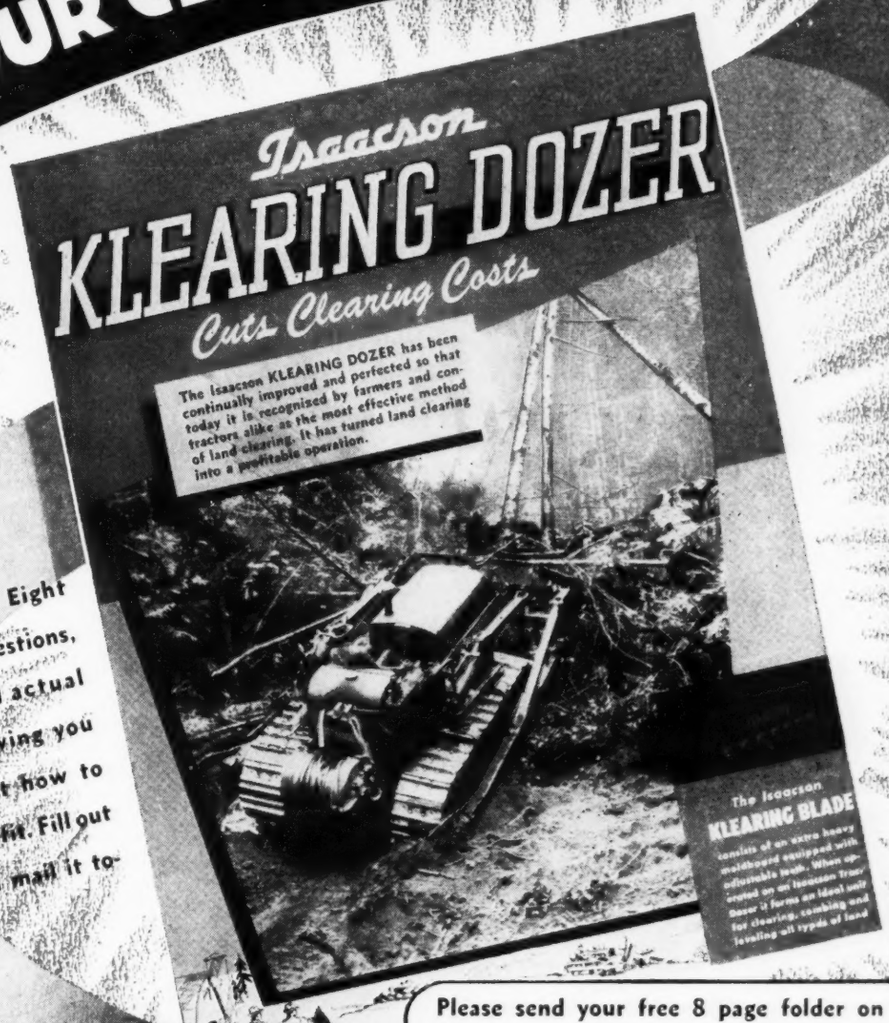
CONTRACTORS Reduce YOUR CLEARING COSTS 50%


Isaacson
KLEARING DOZER
Cuts Clearing Costs
The Isaacson KLEARING DOZER has been continually improved and perfected so that today it is recognized by farmers and contractors alike as the most effective method of land clearing. It has turned land clearing into a profitable operation.
The Isaacson
KLEARING BLADE

NEW!

Just off the press. Eight pages of ideas, suggestions, case histories and actual photographs showing you step by step just how to clear land at a profit. Fill out this coupon and mail it today sure.

Please send your free 8 page folder on Land Clearing for Profit — no obligation of course.

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ISAACSON

Tractor Equipment

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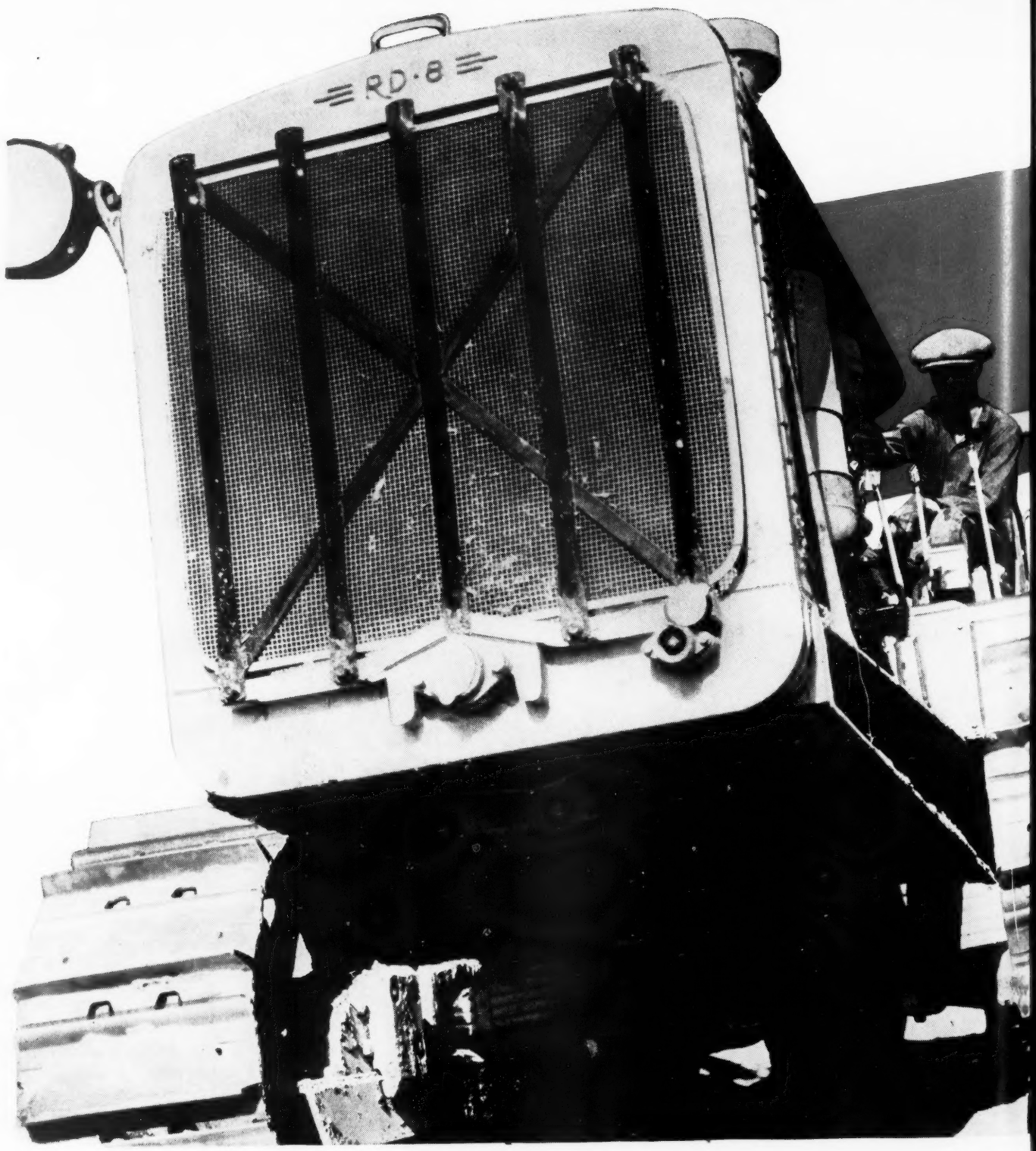


TUNE IN THE
TEXACO STAR THEATRE
WITH JAMES MELTON
EVERY SUNDAY NIGHT
— CBS

TEXACO
REG. T. M.

TEXACO

GET FULL POWER

FULL power from heavy duty gasoline and Diesel engines demands really effective lubrication—and you *get* it with *Texaco Ursa Oil X***. This famous detergent-dispersive oil keeps engines *clean*—resists oxidation, protects alloy bearings, prevents scuffing of rings, pistons and cylinders.

The property of detergency in *Ursa Oil X*** keeps rings free. Dispersion holds deposit-forming materials in suspension until drained. Thus, you get better compression and combustion, greater power and fuel economy.

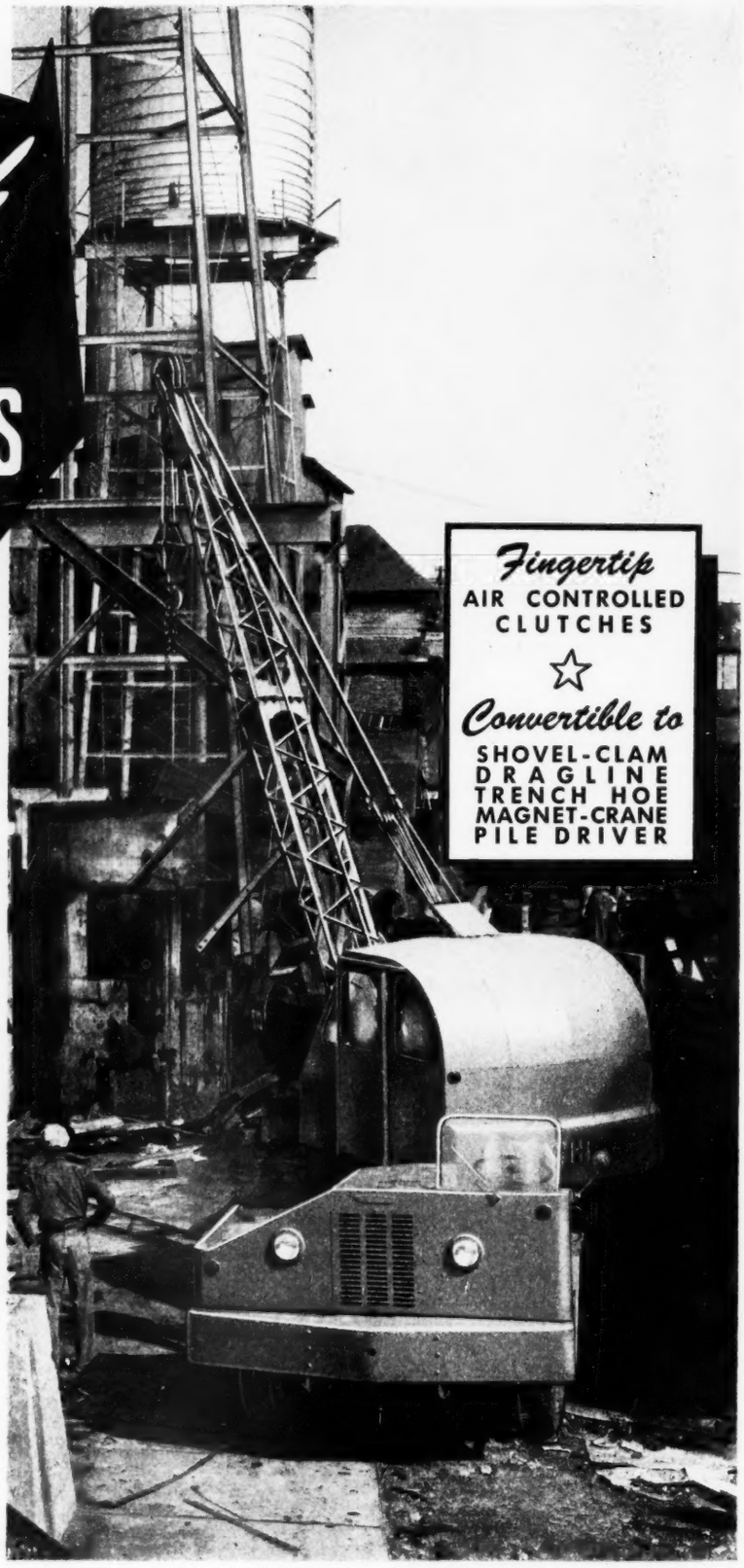
To lubricate air compressors effectively, use *Texaco Alcaid, Algol* or *Ursa Oil*. You'll be sure of wide-opening, tight-shutting valves, free rings, more efficient operation with fewer repairs and replacements.

For Texaco Products and Engineering Service, call the nearest of the more than 2300 Texaco distributing plants in the 48 States, or write The Texas Company, 135 E. 42nd St., New York 17, N. Y.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

fast work
IN
CLOSE QUARTERS



MICHIGAN
Mobile CRANES
ARE "TOPS" FOR JOBS LIKE THIS!

WHEN every minute counts, when limited working space would hamper ordinary equipment, put a MICHIGAN on the job. You'll find that its unexcelled operating speed, handling ease and truck mobility really pays off! And ten to one you'll also find that the job takes less time and costs far less than with other machines or methods.

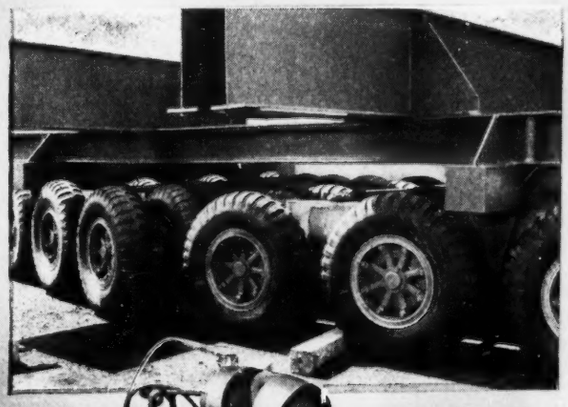
Make a higher percentage of profit from construction and excavating jobs of all types with fully convertible MICHIGAN Air Controlled Mobile CRANES — available in 6 to 12 ton capacities.

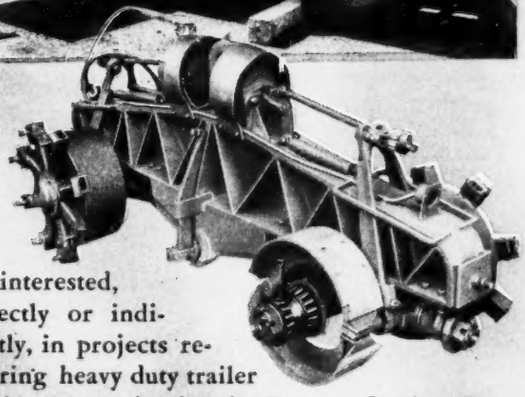
Get The Full Facts
WRITE TODAY FOR BULLETIN CM-46

MICHIGAN
POWER SHOVEL COMPANY
BENTON HARBOR MICHIGAN

LOGICALLY... the world's greatest trailer

was a ROGERS...





If interested, directly or indirectly, in projects requiring heavy duty trailer equipment, write for the Rogers Catalog illustrating and describing units exactly suited to all requirements.

The above trailer (*which actually had a capacity of 600 tons on improved roads with conventional heavy duty tires), was built for Eichleay Engineering Corporation, contractors for the military authorities and sold by Atlas Equipment Company, both of Pittsburgh, Penna.

THE necessity of moving a *300 ton burden, required in connection with a highly secret military test, presented unprecedented problems.

A railroad was out of the question. No vehicle of adequate capacity had ever been built. Failure was unthinkable and speed was imperative.

The search for specialized experience, engineering competency and plant facilities adequate to build a vehicle capable of handling this greatest of all moving projects led inevitably to the pioneer builders of heavy duty trailers.

Drawing upon a long career as manufacturers of commercial trailers and exceptional experience in building thousands of military tank trailers, this organization delivered in 30 days, a trailer 39 feet long and 17 feet wide.

Its sixty-four 14.00″ x 24″ military tires were mounted in banks of eight on axle units that permitted full oscillation to conform to uneven desert terrain and distribute the terrific load equally over all tires.

Significant was the fact that these axle units were duplicates of those that have long been used on ROGERS TRAILERS of larger capacity.

Yes, it is logical that the *world's largest trailer* should have been a ROGERS.

ROGERS BROTHERS CORPORATION
ALBION, PENNA.

EXPERIENCE builds 'em ROGERS HEAVY DUTY Goosenecks Trailers *PERFORMANCE sells 'em*

Porto-Power

PUTS HYDRAULIC POWER

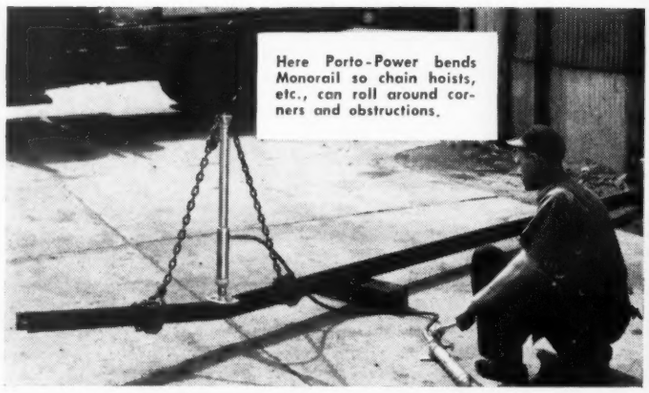
WHERE you want it! . . . WHEN you want it!

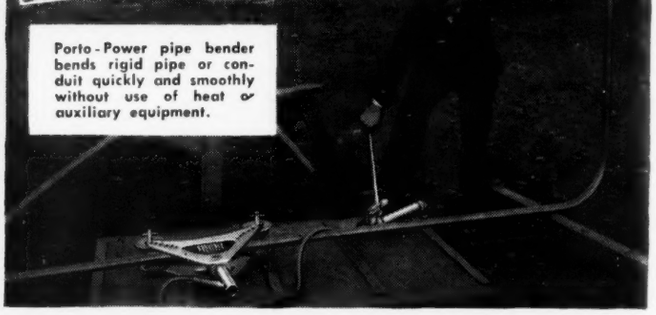
PORTO-POWER HYDRAULIC RAMS are threaded for safe coupling with special attachments!
FLEXIBLE SAFETY HOSE permits ram to work in all directions!
PUMP is operated safely at a distance. All controls are on the pump!

TIGHT spots and tough jobs are "duck soup" for Porto-Power. This compact, easily transportable hydraulic unit brings tons of power right to the job. Myriads of ingenious attachments permit Porto-Power to work with equal ease in close quarters or over long spans — at any angle, on 1001 construction and maintenance jobs. For complete information on Porto-Power see your Blackhawk Equipment Distributor or write us direct.

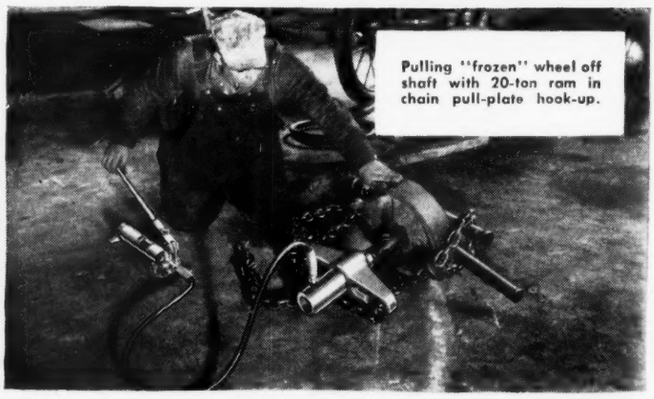
A Product of **BLACKHAWK MFG. CO., Dept. P2346, Milwaukee 1, Wis.**

Equipped with base-plate and toe Porto-Power lifts this heavy steam winch — safer and faster than mechanical jacks or crowbars.


Here Porto-Power bends Monorail so chain hoists, etc., can roll around corners and obstructions.


Porto-Power pipe bender bends rigid pipe or conduit quickly and smoothly without use of heat or auxiliary equipment.

Temporary repairs can be made on the spot and avoid shutdowns. Here a 10-ton Porto-Power combination straightens a drive shaft after a jam up on conveyor.


Pulling "frozen" wheel off shaft with 20-ton ram in chain pull-plate hook-up.

BLACKHAWK

You've got to be GOOD to wear it!

Like a college letter, the AGC rating plate isn't given to just anyone. Only the mixer or paver that has proved itself can wear it. In the words of the plate, the equipment must "guarantee to hold and properly mix a specified number of cubic feet of concrete plus 10% when operating on the level."

Equipment wearing the plate must live up to that guarantee. It is your assurance of quality and capacity . . . your assurance that you won't be guessing when you estimate jobs.

Before you buy, look for the AGC rating plate.

MIXER MANUFACTURERS' BUREAU

Affiliated with the Associated General Contractors of America, Inc.

Member Names

Chain Belt Company
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Dunellen, N. J.

Kwik-Mix Company
Port Washington, Wis.

The Foote Co., Inc.
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The Jaeger Machine Co.
Columbus, Ohio

The T. L. Smith Company
Milwaukee, Wis.

The Knickerbocker Co.
Jackson, Mich.

now you can make money on the smaller black top jobs, too!

the Cedarapids PATCHMASTER

Continuous Mixing

Portable . . . Stationary . . . Low Cost

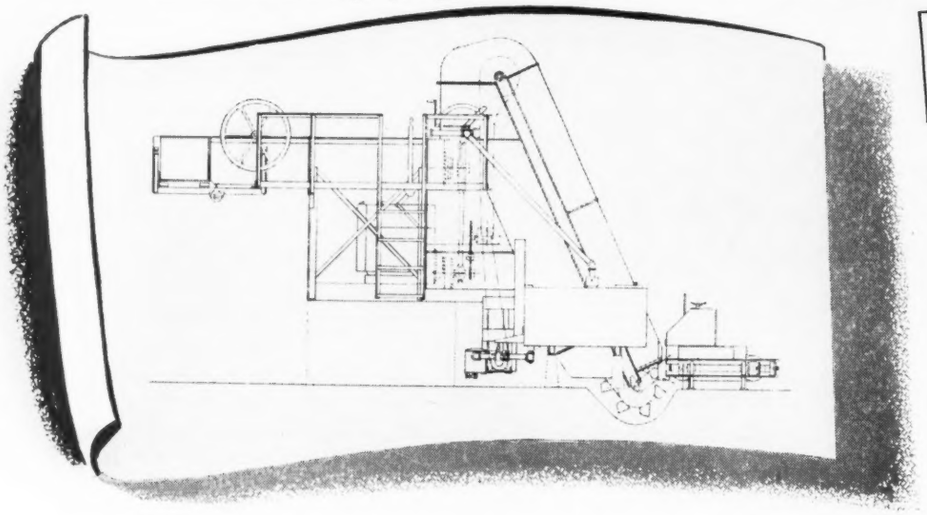
HERE'S the asphalt mixing plant that will really put money into your pockets on all small and medium sized jobs. 25 to 30 tons an hour—150 to 250 tons per day—of uniform, thoroughly coated and mixed aggregate are a cinch for the Patchmaster. Set it up as a permanent plant wherever you have a regular demand for patching material. Keep it on pneumatics if your jobs are widely scattered. Either way you'll find it is the handiest, most profitable maintenance plant you ever saw. You'll be amazed at its accuracy, economy and high capacity. By adding a drier you can handle hot mixes as well.

Ground-level charging hopper assures quick, easy loading. Truck-high pug mill discharge eliminates troublesome delivery conveyor belts. Every part is built to Cedarapids high quality standards for long life, trouble-free operation and low cost.

The Patchmaster is the ideal plant for contractors, townships, counties, cities, state highway departments, large industrial plants or anyone who wants a low-cost, low-priced asphalt mixing plant for their smaller black top jobs. See your nearest Cedarapids distributor or write for Bulletin PM-1.

IOWA MANUFACTURING CO.

Cedar Rapids, Iowa, U.S.A.



Cedarapids

Built by IOWA

THE IOWA LINE

of Material Handling Equipment Includes

ROCK AND GRAVEL CRUSHERS
BELT CONVEYORS—STEEL BINS
BUCKET ELEVATORS
VIBRATOR AND REVOLVING SCREENS
STRAIGHT LINE ROCK AND GRAVEL PLANTS
FEEDERS—TRAPS
PORTABLE POWER CONVEYORS
PORTABLE STONE PLANTS
PORTABLE GRAVEL PLANTS
REDUCTION CRUSHERS
BATCH TYPE ASPHALT PLANTS
TRAVELING (ROAD MIX) PLANTS
DRAG SCRAPER TANKS
WASHING PLANTS
TRACTOR-CRUSHER PLANTS
STEEL TRUCKS AND TRAILERS
KUBIT IMPACT BREAKERS

Put a Wallop
behind your air tools
WITH A DEPENDABLE, EFFICIENT LE ROI COMPRESSOR
. . . famous for a full quota of productive hours — on all tough jobs. Enjoy the extra profits derived from Le Roi mobility and power. A size and mounting for every job!
Le Roi Company • Milwaukee 14, Wisconsin
NEW YORK • WASHINGTON • BIRMINGHAM • TULSA • SAN FRANCISCO
LE ROI
MILWAUKEE
LE ROI
TURN THE PAGE

LE ROI
MILWAUKEE

AIRMASTER

315-ft. Compressor

. . . field-proven for your heaviest work

Steady . . . dependable . . . economical air power . . . ready to go at an instant's notice . . . ready to take the punishment of day in and day out operation . . . that's the new Le Roi 315 Airmaster.

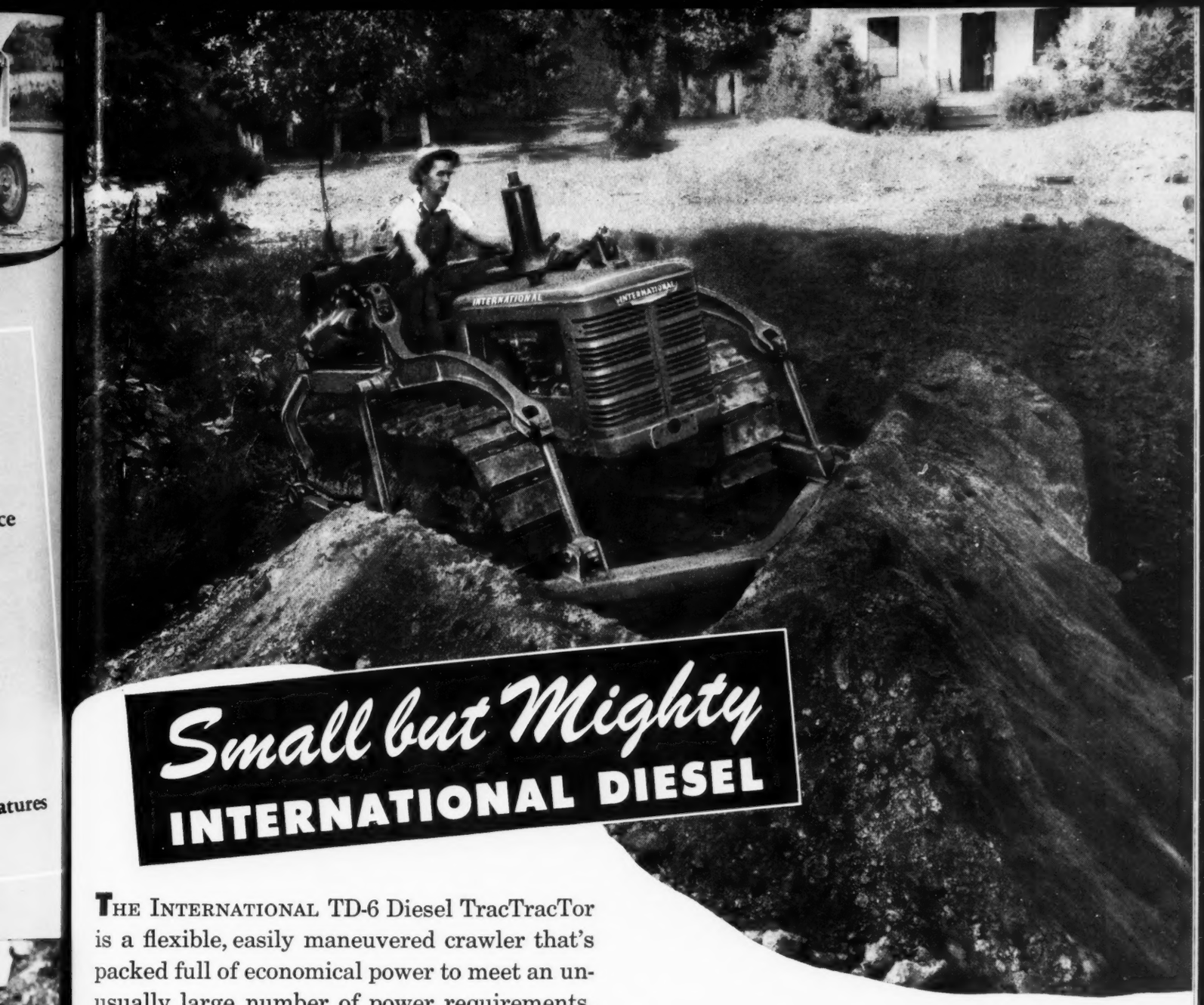
It's a big, husky unit with all the refinements, precision-machined parts, and modern design that are typical of efficient, economical Le Roi air power. For the complete story of the new streamlined "315 Airmaster," see your nearby Le Roi distributor, or write direct for Bulletin C-5.

Le Roi Company • Milwaukee 14, Wisconsin

NEW YORK • WASHINGTON • BIRMINGHAM • TULSA • SAN FRANCISCO

- Full Diesel Economy
- Extreme Mobility
- Ultra-Smooth Performance
- Full Length Tool Boxes
- Electric Starting
- Super-Finished Valves
- Automotive Steering

—plus many other features



Small but Mighty
INTERNATIONAL DIESEL

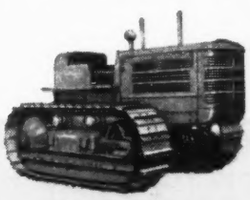
THE INTERNATIONAL TD-6 Diesel TracTracTor is a flexible, easily maneuvered crawler that's packed full of economical power to meet an unusually large number of power requirements.

Take its performance on the backfilling job illustrated. With a bullgrader of matched size, it backfills 700 to 800 feet of 6 to 8 ft. ditch each 10 hour day.

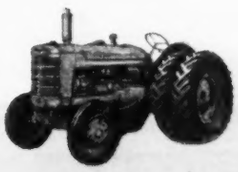
Positive, instant starting, combined with International construction, performance and long life, gives the TD-6 everything: fast action, modern appearance, balanced power and weight, and *full-Diesel* economy. Put it to work on the many jobs now coming up for attention and see how it takes on punishing work at new low cost.

The nearest International Industrial Power Distributor will give you further facts, answer your questions and take your order for the International Tractors or Power Units best suited to your needs.

Industrial Power Division
INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue **Chicago 1, Illinois**


TRACTRACTORS

POWER UNITS


WHEEL TRACTORS

INTERNATIONAL INTERNATIONAL HARVESTER **Industrial Power**

You can
LAY WATER PIPE FASTER
when it's easy-to-handle Transite

KEEPING UP with the trenching machine is common practice when the pipe being installed is Transite!

Crews can unload and install this easy-to-handle, asbestos-cement pipe quickly . . . lay all but the larger sizes without mechanical handling equipment. The Simplex Coupling cuts assembly time . . . assures tight, yet flexible joints.

And in addition, Transite delivers these *long-term* advantages:

No tuberculation. Made of asbestos and cement, its initial high flow rate (C=140) is unaffected by tuberculation. Users never have to contend with excessive pumping costs resulting from this costly form of internal corrosion.

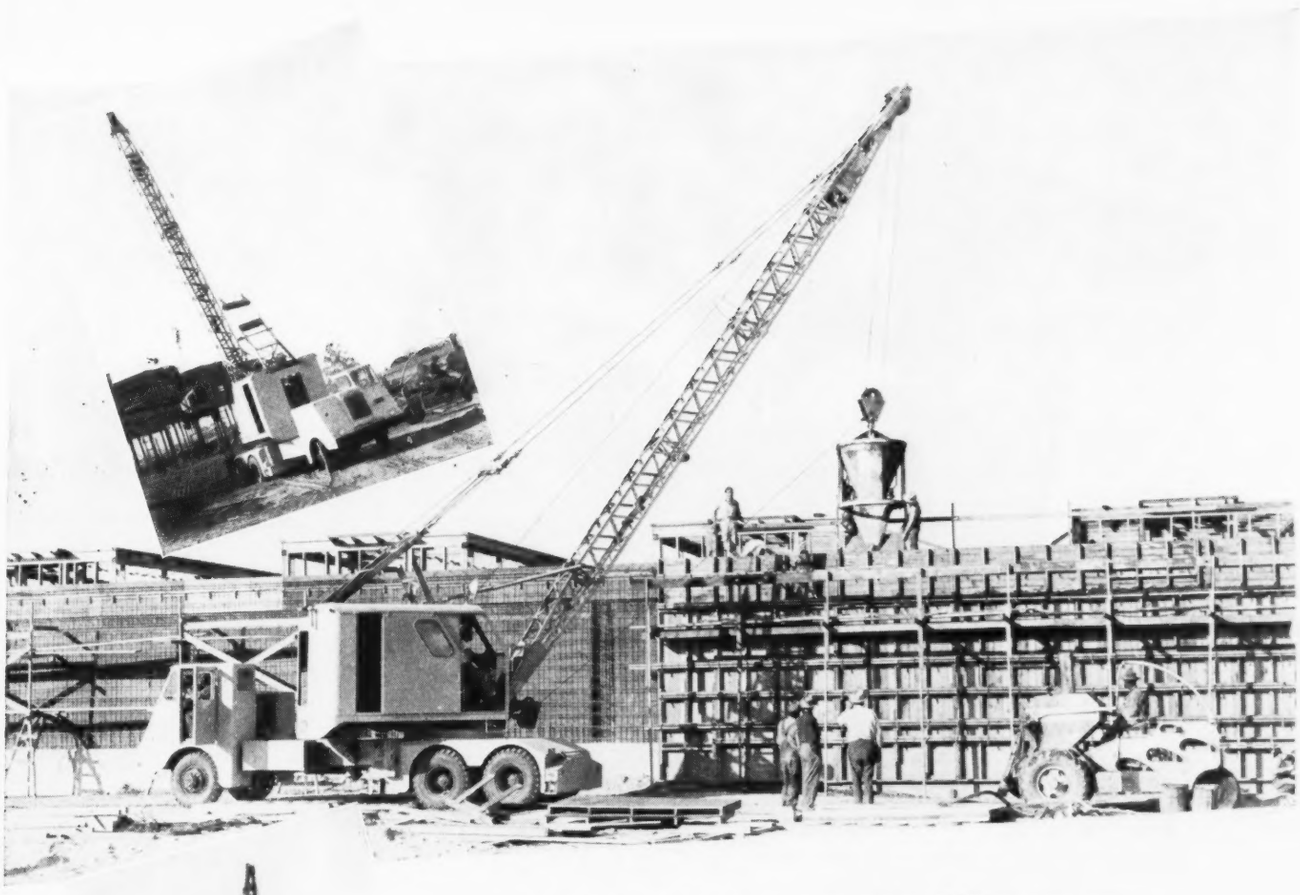
High corrosion resistance—outside, as well as inside and all the way through! Thousands of Transite Pipe installations—many in highly aggressive soils—testify to its exceptional resistance to soil corrosion.

Low maintenance. Transite's tight joints, high uniform strength, great durability and proved corrosion resistance all add up to low maintenance. Over the years, Transite Pipe has established an enviable record for economy in water distribution and supply lines throughout the country.

For complete information, write for brochure TR-11A. Johns-Manville, Box 290, New York 16, New York.

JOHNS MANVILLE JM PRODUCTS

Johns-Manville
TRANSITE PRESSURE PIPE
An Asbestos Product

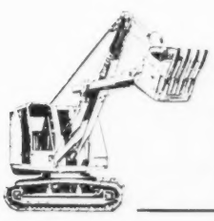


BAY CITY CRANEMOBILE

Gets No Rest on Big Project

The versatile performance of this 20-ton BAY CITY CraneMobile working for Robt. E. McKee, general contractor of Los Angeles and El Paso erecting a five-million dollar federal building on the Pacific Coast, is an on-the-job testimonial to the flexibility and dependability of this modern machine. Swinging a one-yard bucket at the end of a 50-ft. boom to place concrete precisely where it is needed is only one of the many jobs performed swiftly and easily. When elevators of the batching plant broke down, the CraneMobile hoisted material into hoppers until repairs were made. It has been lifting compressors, small trucks, and other construction equipment in and out of the partially-completed structure—digging excavations, hoisting reinforcing steel, moving concrete forms, etc. On any job a CraneMobile is in constant demand for these and many other jobs where heavy materials must be moved quickly and surely to keep construction going ahead at a profit-making pace. For complete information see your nearest BAY CITY dealer or write today to BAY CITY SHOVELS, INC., Bay City, Michigan.

BAY CITY



SHOVELS • DRAGLINES
CRANES • HOES • CLAMSHELLS

SEE YOUR NEAREST DEALER for Bay City excavating and material handling equipment in sizes from ⅜ to 1¼ yards having crane rating up to 20 tons. Both crawler and pneumatic tire mounting.

EXTRA WALLOP *for Faster* { BREAKING / SHEETING DRIVING / SPIKE DRIVING

Short Front Heads for Spike Driving; interchangeable on tool.

Standard Front Head—with Latch Retainer for general demolition work.

Sheeting Driver Head—interchangeable with Standard Front Head.

with Thor

PAVING BREAKERS

YOU CAN USE the extra power of Thor Paving Breakers to do many *different* jobs. As hard-hitting demolition tools they break concrete, rock and ice; cut asphalt; tamp dirt; dig clay and hard pan. Used with Sheeting Driver attachment, they quickly drive wood or steel sheeting as thick as 3 inches. Another simple change of the front head and they become heavy-duty Spike Drivers.

EXTRA POWER Speeds the Work

On *every* job, Thor Breakers are bonus makers. Thor's exclusive short-travel, tubular valve gets more work from *all* the air to drive a reversible, block-type piston in harder blows. Air cushioning of the piston in the cylinder—plus perfect timing and balance—provide smooth operation for easy handling. Air vents in the sturdy back head keep the handle remarkably cool. Rugged construction means long-life and low maintenance cost. You can get these benefits on your own jobs now . . . ask your nearby Thor distributor.

INDEPENDENT PNEUMATIC TOOL COMPANY
600 W. Jackson Blvd., Chicago 6, Illinois

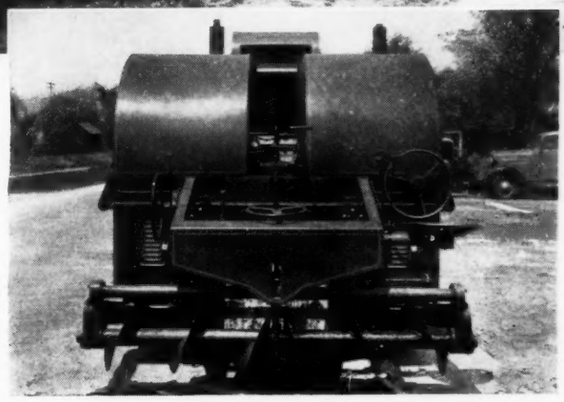
Birmingham Boston Buffalo Cleveland Detroit Los Angeles Milwaukee New York Philadelphia
Pittsburgh St. Louis Salt Lake City San Francisco Toronto, Canada London, England

Thor PORTABLE POWER TOOLS

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS

H&B Moto-Paver

THE COMPLETE TRAVELING MIXER AND PAVER



Rear view, with strike-off bar removed to show the patented spreading arrangement and controls

★ SELF-CONTAINED ★ SELF-PROPELLED
★ MIXING CAPACITY 100 TO 120 TONS PER HOUR
★ PAVING SPEED 4 TO 50 FT. PER MIN.
★ ROAD SPEED UP TO 18 MILES PER HOUR

MIXES, SPREADS AND LAYS ANY TYPE OF MIXED-IN-PLACE BITUMINOUS MATERIAL TO ANY ROAD WIDTH, THICKNESS AND CROWN CONDITION

The Moto-Paver does the *complete mixing and paving job.* No separate loader or spreader is required—no trailer to haul the machine from one job to another.

This highly flexible mobile plant is especially adapted for resurfacing work on county roads and city streets, because of the different types of pavement that can be produced with it, and because it can be quickly moved from one job to another under its own power. The Moto-Paver is also highly efficient on new construction.

Bulletin MP-46, giving complete information and specifications, will be sent on request.

HETHERINGTON & BERNER INC. • 735 KENTUCKY AVENUE, INDIANAPOLIS 7, INDIANA

Hetherington & Berner

BUILDERS OF PORTABLE AND STATIONARY ASPHALT PLANTS OF ALL TYPES AND CAPACITIES

Planning a Pier?

Begin it Right with MONOTUBES

JOB-EXPERIENCED engineers and contractors . . . with an eye on lower costs . . . are enthusiastic in their endorsement of all-steel Monotube foundation piles.

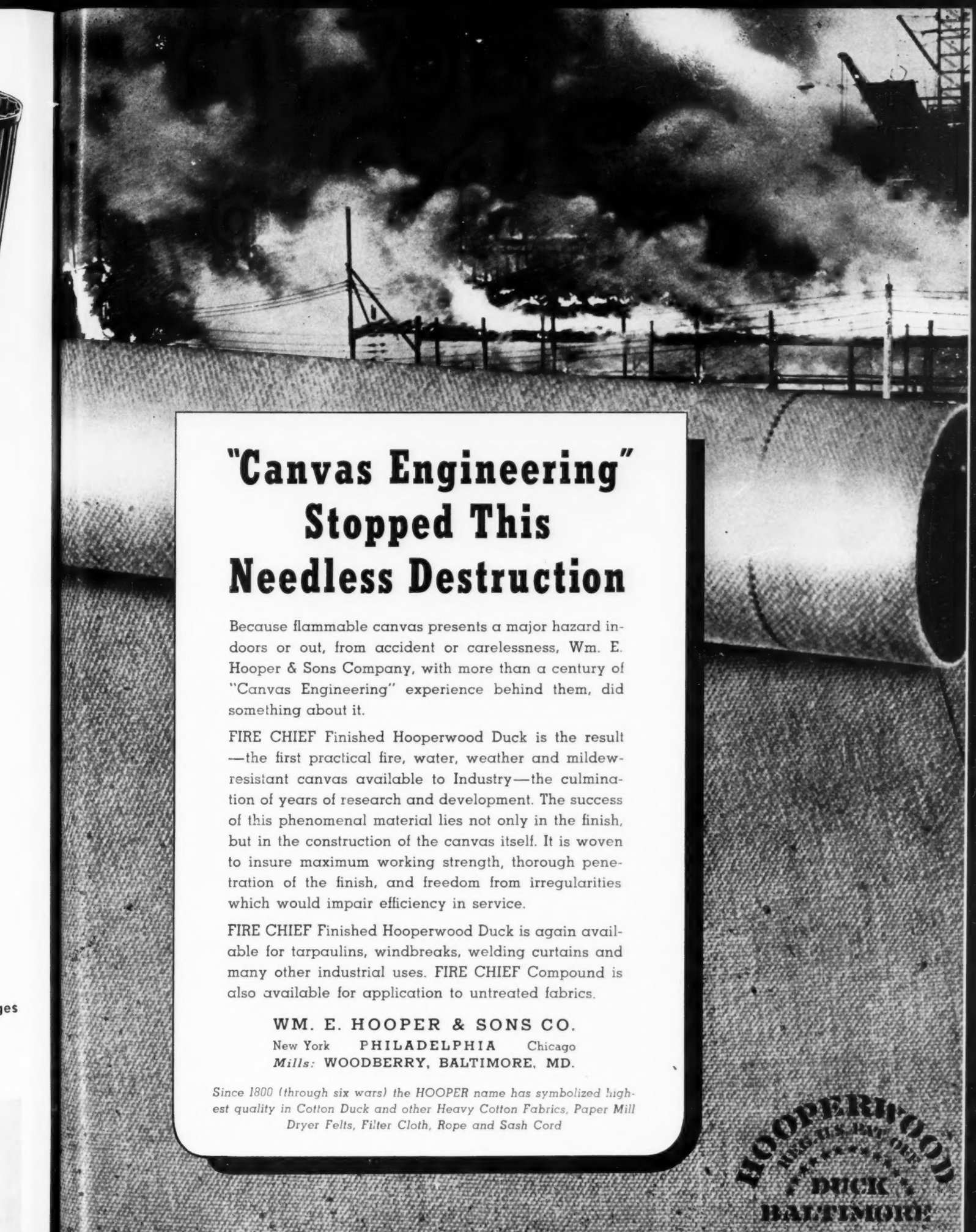
Here's why:

Monotubes have an exclusive fluted, tapered design that makes driving with average job equipment result in lower costs and no delays. A special extendible feature allows quick, simple field extensions with either tapered or uniform sections. And as for inspection—they're hollow, top-to-toe. You can be *sure* they're right before concreting. Ready for your next job in a gauge, size and taper to suit your needs. For complete information, write The Union Metal Manufacturing Company, Canton 5, Ohio.

Also for—
Buildings—Bridges
Airports and
Highways

UNION METAL

Monotube Tapered Piles



"Canvas Engineering" Stopped This Needless Destruction

Because flammable canvas presents a major hazard indoors or out, from accident or carelessness, Wm. E. Hooper & Sons Company, with more than a century of "Canvas Engineering" experience behind them, did something about it.

FIRE CHIEF Finished Hooperwood Duck is the result —the first practical fire, water, weather and mildew-resistant canvas available to Industry—the culmination of years of research and development. The success of this phenomenal material lies not only in the finish, but in the construction of the canvas itself. It is woven to insure maximum working strength, thorough penetration of the finish, and freedom from irregularities which would impair efficiency in service.

FIRE CHIEF Finished Hooperwood Duck is again available for tarpaulins, windbreaks, welding curtains and many other industrial uses. FIRE CHIEF Compound is also available for application to untreated fabrics.

WM. E. HOOPER & SONS CO.

New York **PHILADELPHIA** Chicago

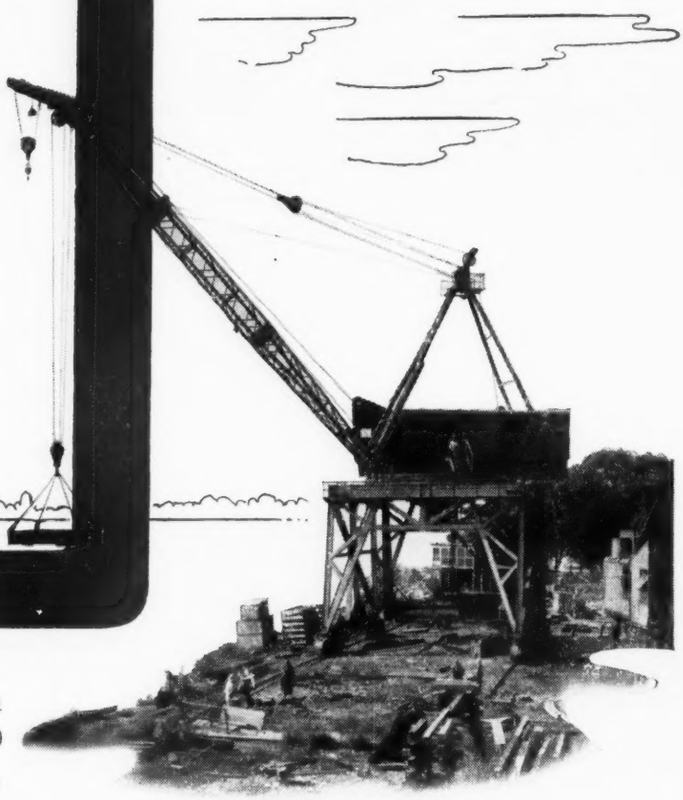
Mills: **WOODBERRY, BALTIMORE, MD.**

Since 1800 (through six wars) the HOOPER name has symbolized highest quality in Cotton Duck and other Heavy Cotton Fabrics, Paper Mill Dryer Felts, Filter Cloth, Rope and Sash Cord

HOOPERWOOD
REG. U.S. PAT. OFF.
DUCK
BALTIMORE

HOOPERWOOD COTTON DUCK

Enginairing makes this giant WILEY crane answer a finger touch

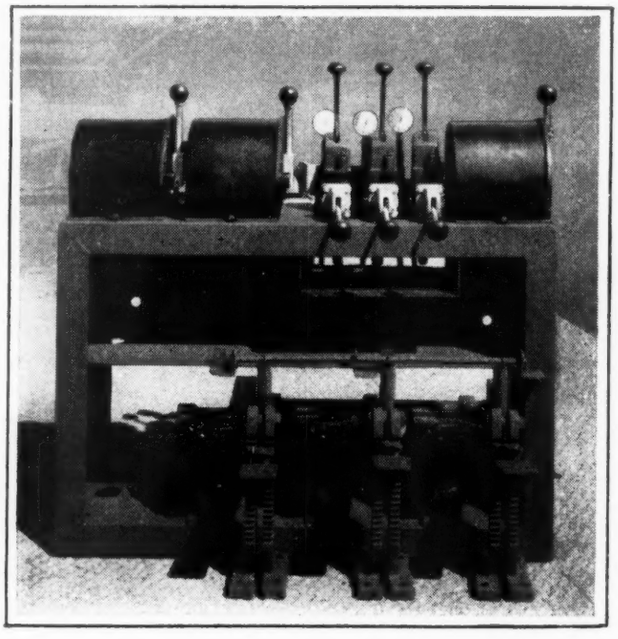


With a cab as big as a box car and a boom that can reach out 50 feet and lift 100,000 pounds or more, this gantry-mounted crane, built by Wiley Equipment Company, is put through its paces by a mere finger touch on its W·A·B Controls.

All equipment is concentrated on one stand, directly in front of the operator. The three valves at top operate the three friction drums of the hoist mechanism. The three valves directly below actuate the pawls which hold the drums, and the three foot-operated valves at the bottom apply the brakes.

W·A·B Controls make life easier for the operator, by eliminating the muscling of heavy levers. Equipment is simple, rugged and dependable. The wear and play of mechanical linkage are banished. The smooth, flexible control of all operations does away with destructive jerks and jars.

When you buy new cranes, be sure to specify W·A·B Controls, for ease and precision of operation.

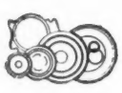


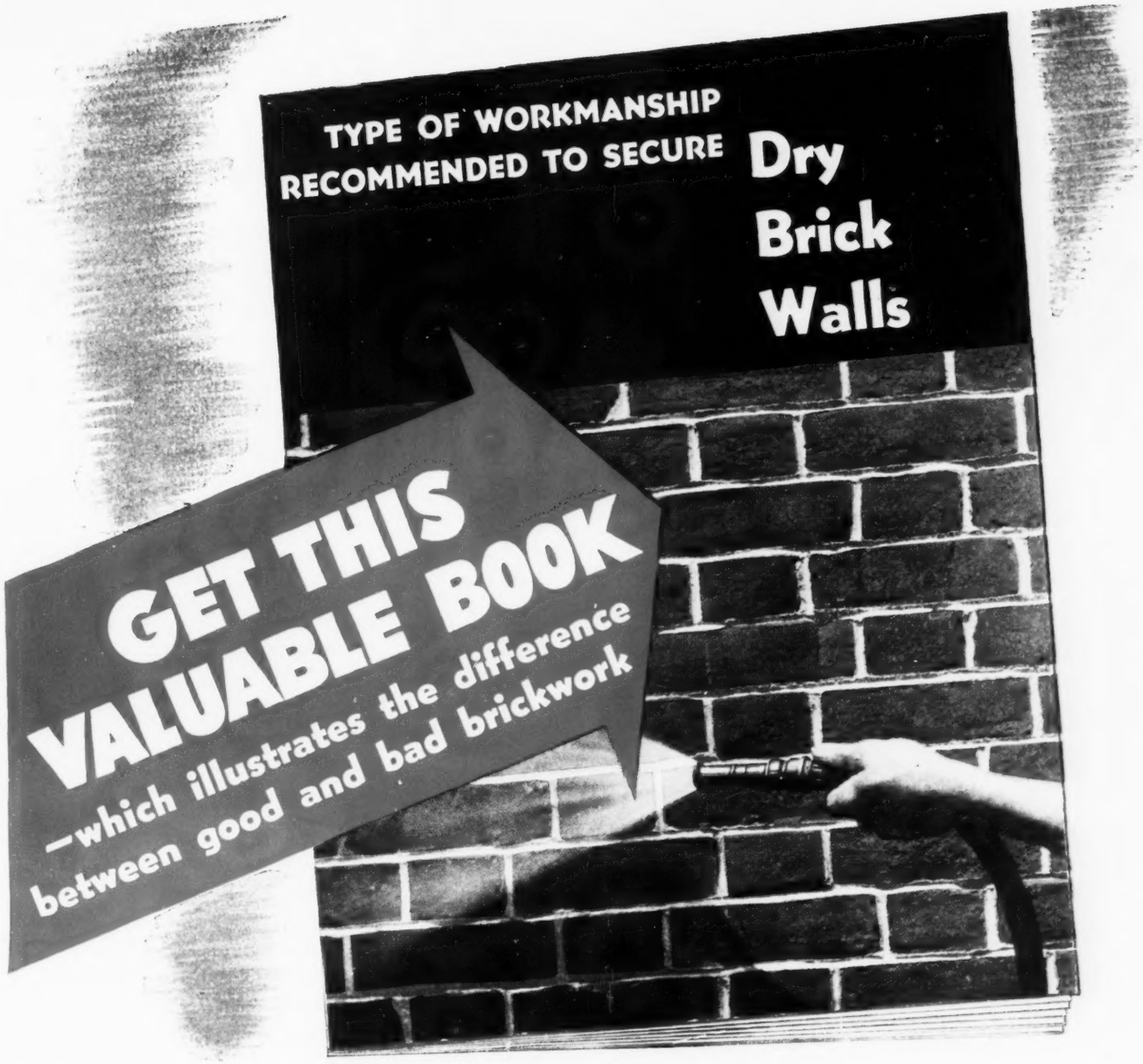
WESTINGHOUSE AIR BRAKE COMPANY

INDUSTRIAL DIVISION · WILMERDING, PA.

PNEUMATIC CONTROLS

AIR COMPRESSORS

 WABCO PACKING



FOR many years intensive research on the cause and prevention of leaky brick walls has been conducted by various organizations and individuals, and much vital information has been gathered.

Most authorities agree that *workmanship* is the most important thing involved, but until now, no one has attempted to explain and *illustrate* the difference between good and bad workmanship.

"Type of Workmanship Recommended to Secure Dry Brick Walls" does just that. In it, a recognized authority on brickwork has compiled 16 pages of proven information — explanations and recommendations — 96 color illustrations. It is a major contribution to *good building.* It will be sent free to any architect, contractor or dealer who is interested in water-tight masonry.

Use the coupon to secure your copy. No obligation of any sort.

Louisville Cement Co., *Incorporated*
309 Guthrie Street, Louisville 2, Kentucky

Gentlemen: Without obligation, please send me a copy of "Type of Workmanship Recommended to Secure Dry Brick Walls."

Name_____

Firm_____

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Better Trucks for YOUR Business!

"CONSTANT HEAVY LOADINGS; VERY LOW TON-MILE COSTS"

"For the past twenty-four years," wrote Mr. J. Roy Pennell, president of Pennell & Harley, Inc., construction engineers, of Spartansburg, S. C., recently, *"we have been constant users of Ford Trucks in construction work and our experience has been such that we are continuing to use Ford Trucks."*

Carrying, as illustrated, the charged mixer plus its power unit, the Pennell & Harley Ford Trucks are getting a real workout every minute they're on the job.

"These trucks have been constantly loaded beyond the Ford Motor Company's rated capacity," Mr. Pennell stated, *"yet they have carried the loads at a very low ton-mile cost."*

It's steady, and thoroughly capable performance such as this that has made the Ford Truck one of the prime favorites in construction work. Generous frame strength, ample axle and clutch capacity and Ford-engineered V-8 or 6-cylinder power that's won a world-wide reputation for rugged reliability—all this is enhanced by important new engineering developments in today's new Ford Trucks. Let your Ford Dealer furnish you with the full facts.

Ford

ADVANCED ENGINEERING IN NEW FORD TRUCKS

More Economy and Endurance
Easier Servicing

A STILL GREATER 100 HP V-8 ENGINE with NEW Ford steel-cored Silvaloy rod bearings, more enduring than ever in severe service • NEW aluminum alloy cam-ground 4-ring pistons for oil economy • BIGGER, more efficient oil pump and IMPROVED rear bearing oil seal • NEW longer-lived valve springs • NEW improvements in cooling • NEW efficiency in ignition • in carburetion • in lubrication • in ease and economy of servicing operations • And available in all truck chassis except C.O.E. units—the rugged, thrifty 90 HP FORD SIX-CYLINDER ENGINE, with many important advancements.

FORD CHASSIS ADVANTAGES: Easy accessibility for low-cost maintenance • Universal service facilities • Tough, forged front axles • Extra-sturdy rear axles with pinion straddle-mounted on 3 large roller bearings, ¾-floating type in light duty units, full-floating in all others • 3 axle ratios available (2 in 1-ton unit) • 2-speed axle available in heavy duty units at extra cost • Powerful hydraulic brakes, large drums, cast braking surfaces • Rugged 4-speed transmission with NEW internal reverse lock optional at extra cost on light duty units, standard on all others.

FORD TRUCKS

MORE FORD TRUCKS ON THE ROAD • ON MORE JOBS • FOR MORE GOOD REASONS

WITH BUCYRUS-MONIGHANS IT'S *All Weather* PERFORMANCE

When bad weather makes footing too soft for other excavators, your Bucyrus-Monighan walking dragline will keep going, delivering the big output for which it is famous. Smooth walking traction carries it safely, surely around trouble — the large bearing area provides solid footing even in soft muck. Long reach, quick swing, fast hoisting, and controlled lowering insure fast digging.

That's the essence of the Bucyrus-Monighan performance story—the result of "years-ahead" design and construction, the reason you get your excavating work done **fast** with a Bucyrus-Monighan on the job.

Plan now to include field-proved Bucyrus-Monighans in your excavating equipment. Take advantage of their all-weather performance for quick solutions to your digging problems.

Sold by

BUCYRUS-ERIE COMPANY

"Years Ahead" Excavators for the Years Ahead

SOUTH MILWAUKEE, WISCONSIN

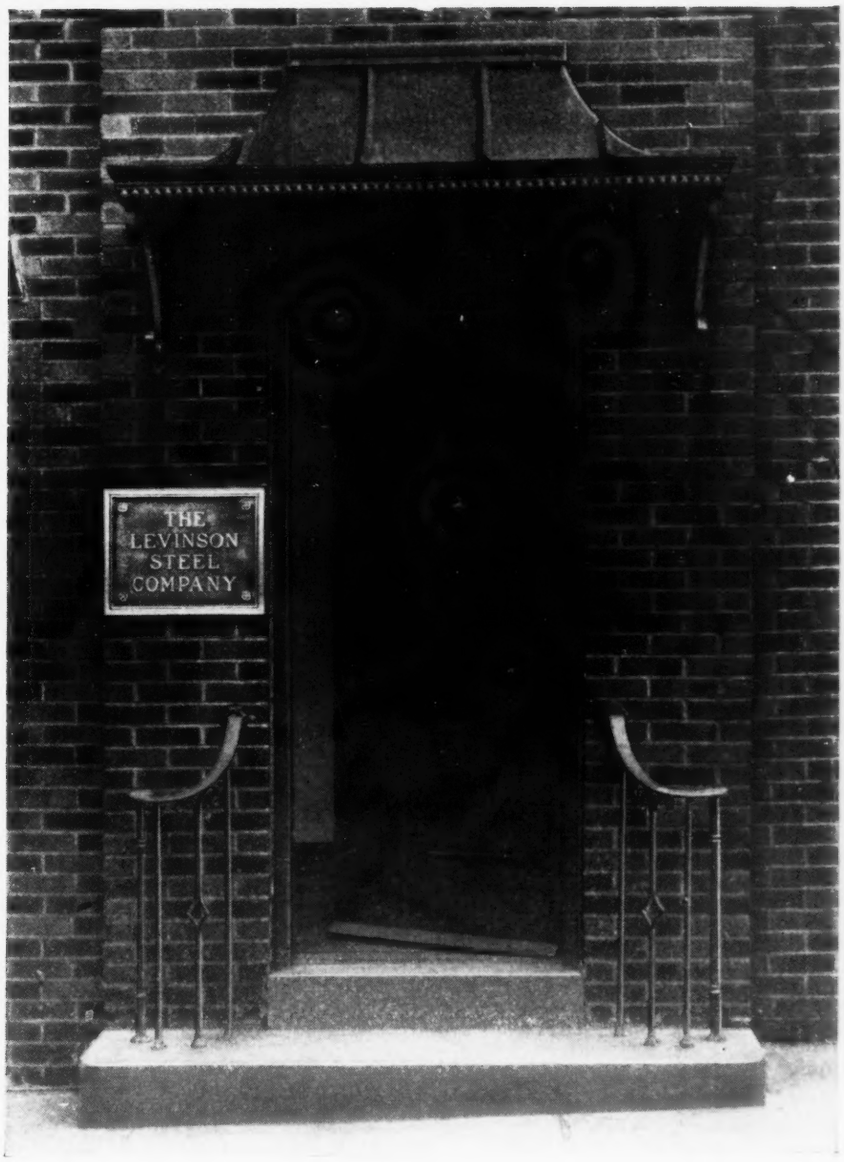
Just connect the bulldozer conversion unit illustrated here to a Huber Maintainer . . . it's as simple as that . . . and you have a bulldozer which will move plenty of dirt for you . . . and move it fast! Huber's bulldozer unit has a 6' blade, 20" deep, which can be raised and lowered hydraulically from 20" above to 1" below ground level. There's plenty of push behind it, too—thanks to the Maintainer's sturdy, dependable 32 horse engine. Why not ask your nearest Huber distributor for a bulldozer demonstration . . . today?

THE HUBER MFG. COMPANY • MARION, OHIO, U. S. A.

HUBER

3 WHEEL & TANDEM ROLLERS

YEAR 'ROUND MAINTAINER



. . . the door that's always open

YES, there may be shortages of vital material; production and delivery schedules may be interrupted because of conditions beyond our control—but here at Levinson the door is still always open.

For despite unusual conditions that may arise from time to time, we want you to know our organization welcomes your inquiries. We may or may not be in position to take care of your immediate requirements, but be assured of a warm, courteous greeting and a sincere effort to help work out your problems.

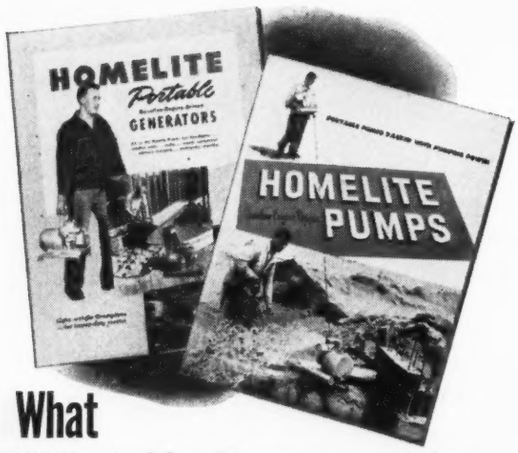
LEVINSON STEEL

THE LEVINSON STEEL CO.

Warehousers Fabricators

33 PRIDE ST., PITTSBURGH 19, PA.

LS-1



See What HOMELITE Portable Pumps and Generators will do On Paper

Two new bulletins . . . L501 on Homelite Portable Pumps and L406 on Homelite Portable Generators . . . will bring you up-to-date on all the latest developments in Homelite design and performance. Send for these two bulletins. Look them over carefully. *But don't stop there.*

then see what they'll do on the job

Homelite Representatives, now located in strategic centers throughout the country, are ready to give actual on-the-job demonstrations of Homelite pump and generator performance. Let them give one for you. Let them show you all the pumping qualities of Homelite Portable Pumps. Let them show you the new Homelite Portable Generators in action . . . running floodlights or all kinds of electric tools . . . on *your* job, any place, any time. Simply write.

HOMELITE
CORPORATION
Portable Pumps, Generators, Blowers
PORT CHESTER, NEW YORK

BRANCH OFFICES

Albany, N. Y. Chicago, Ill. Hartford, Conn. Orlando, Fla.
Atlanta, Ga. Cincinnati, O. Kansas City, Mo. Philadelphia, Pa.
Baltimore, Md. Cleveland, O. Los Angeles, Cal. St. Louis, Mo.
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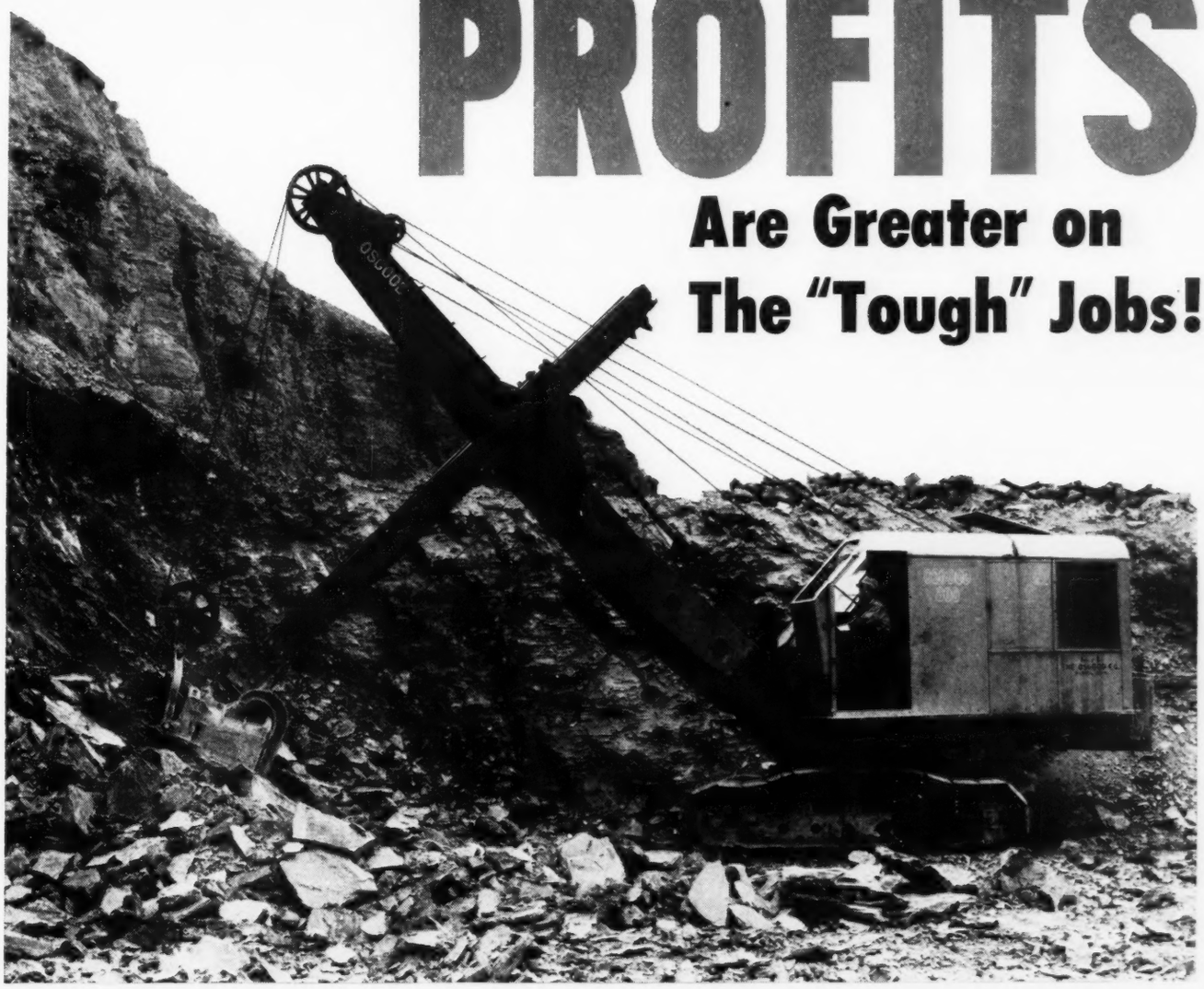
PROFITS

Are Greater on The "Tough" Jobs!



"TOUGH" construction jobs can be the most profitable . . . IF your equipment can stand up under punishing service and the most difficult operating conditions. Experienced contractors know that OSGOOD equipment is designed and built to provide dependable, economical service under any conditions . . . that's why you'll see OSGOOD equipment on most of the big construction jobs.

Since 1872, OSGOOD has built equipment—power shovels, cranes, draglines, clamshells, backhoes and pile drivers—engineered to do the job faster, better and at lower cost. Plan now to enjoy the advantages that only OSGOOD, with its three quarters of a century of manufacturing experience can provide. You'll have an "edge" in bidding on those "tough" jobs of the future if you'll plan to use OSGOOD equipment . . . . . built to take the toughest jobs in stride!

THE GENERAL EXCAVATOR COMPANY
CRANES, DRAGLINES AND SHOVELS
DIESEL, GAS, ELECTRIC

Associated with The General Excavator Company

OSGOOD
CRANES-SHOVELS MARION OHIO U.S.A. OSGOOD GENERAL

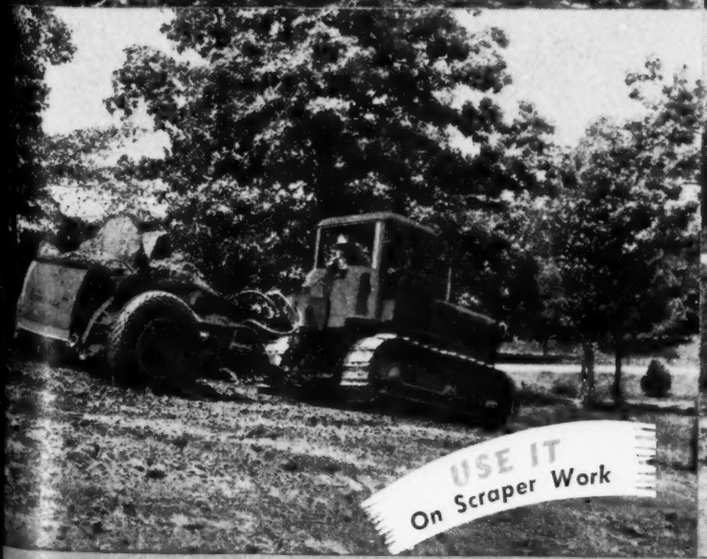
THE OSGOOD COMPANY • MARION, OHIO

OSGOOD
SHOVELS, DRAGLINES CRANES
CRAWLER & WHEEL MOUNTS
DIESEL, OIL, GAS, ELECTRIC

TRAVEL WHERE YOU WILL

an HD-7 will cross your path

It's a country-wide hit! East Coast, West Coast, North and South . . . popular Allis-Chalmers Model HD-7, 2-Cycle Diesel Tractor is in demand everywhere . . . by contractors, states, counties, townships, ranchers, loggers, miners, gravel and quarry pit operators . . . for a multitude of jobs! Just the right size for most bulldozing work, ideal for operating 2-wheel scrapers — provides 60 drawbar h.p., speeds to 5 m.p.h. . . . it's easy on fuel, easy on maintenance cost, easy to maneuver. Starts instantly! Travel where you will . . . you will find the HD-7 keeping production up . . . costs down. It will pay you to get all the facts from your Allis-Chalmers dealer.



ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Why a BG Ditcher can cut through hard material

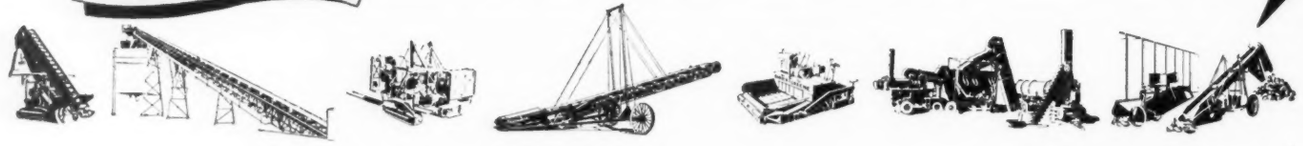
• Just as a milling head steadily cuts through a piece of steel, so does the Barber-Greene Ditcher mill through tough materials. The closely spaced buckets, each taking small, even bites, travel at a high rate of speed, giving a milling action against the digging face. The vertical boom, exclusive with Barber-Greene Ditchers, causes the buckets and digging teeth to pull straight up against the work.

Frozen ground, coral rock, caliche—these are some of the hard materials through which Barber-Greene Ditchers have successfully and economically cut.

Catalog 44 describes and illustrates the many mechanical features and models of these versatile ditchers. Obtain a copy from your Barber-Greene distributor or write direct to Barber-Greene Company, Aurora, Illinois.

46-3

BG Barber-Greene CONSTANT FLOW EQUIPMENT

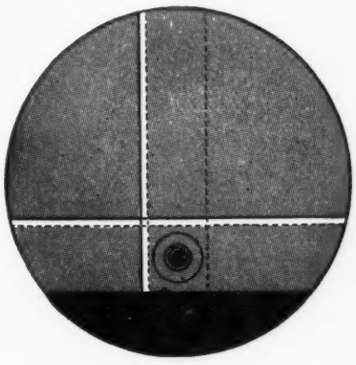


Cut "*On the Job*" Material Losses

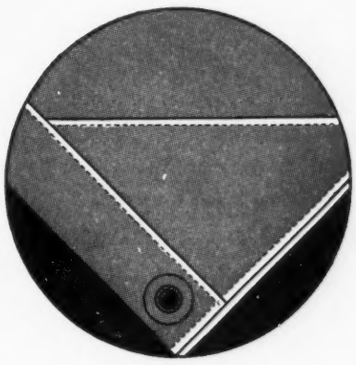
Protect with Bemis "Dri-Tite" Tarpaulins

Bemis "Dri-Tite" tarpaulins are now available in all standard sizes in varying weights. You'll find them real protection against moisture because the "Dri-Tite" waterproofing process renders paulins fully resistant to moisture. There's no "running" or softening in hot weather or stiffening and cracking in cold weather. Write to Bemis today for your 1946 price schedule on the complete "Dri-Tite" line of tarpaulins.

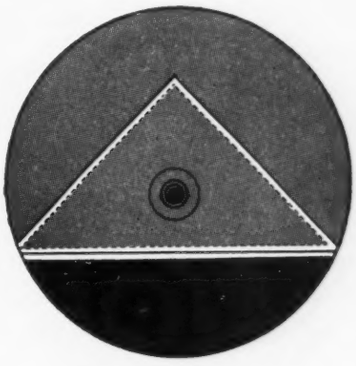
Look at These Construction Features of Bemis "Dri-Tite" Tarpaulins



1. Seams are double sewed with extra heavy rot-proof thread.



2. Corners are reinforced with an extra patch of canvas.



3. Rustproofed rolled rim spur grommets for extra strength.

BEMIS BRO. BAG CO.

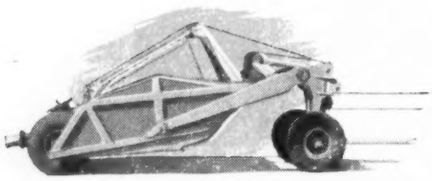
408 Pine St., Box 17, St. Louis 2, Mo.

Baltimore • Boston • Brooklyn • Buffalo • Charlotte • Chicago • Denver • Detroit • East Pepperell • Houston • Indianapolis
Kansas City • Los Angeles • Louisville • Memphis • Minneapolis • Mobile • New Orleans • New York • Norfolk • Oklahoma City
Omaha • Orlando • Peoria • St. Helens • St. Louis • Salina • Salt Lake City • San Francisco • Seattle • Wichita • Wilmington, Calif.

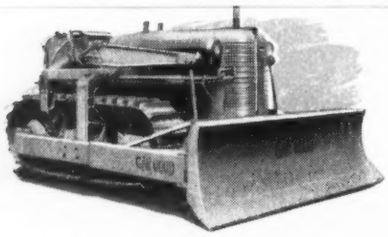
The trend is to—

GAR WOOD ROAD MACHINERY

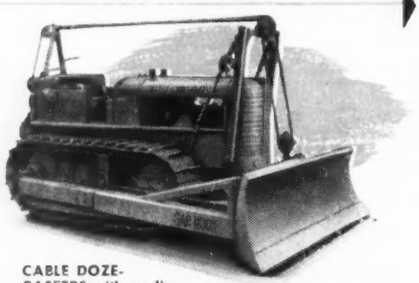
WITH ALLIS-CHALMERS DIESEL POWER



4-WHEEL CABLE SCRAPERS
Capacities: 11-15-20-25 cu. yds.



HYDRAULIC DOZECASTERS with angling blades, for all Allis-Chalmers Tractors



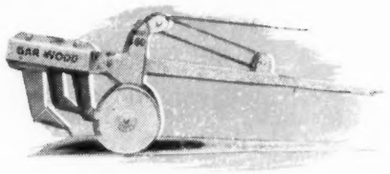
CABLE DOZE-CASTERS with angling blades, for Allis-Chalmers HD-10, HD-14 and HD-14C Tractors

On every kind of earth moving job, throughout the world, Gar Wood Road Machinery has made good, setting new high standards of performance and workmanship.

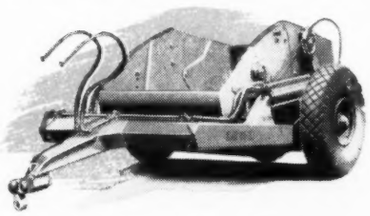
As a result, the demand for this equipment has steadily grown over a period of many years (see chart above) until now it has reached the proportions of a world-wide trend.

Here is a sound reason for specifying Gar Wood earth moving units. "Nothing succeeds like success."

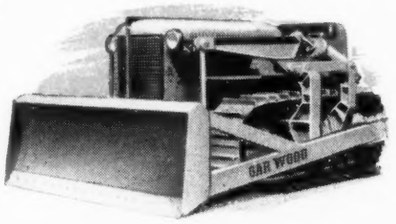
Contact your Allis-Chalmers dealer. Let him point out the superior features of Gar Wood Road Machinery and show you actual job performance in your territory with many satisfied users.



HEAVY DUTY RIPPERS
Cable and hydraulically operated



2-WHEEL HYDRAULIC SCRAPERS
Capacities: 3-5-6-8 cu. yds.



HYDRAULIC BULLDOZERS with fixed blades, for all Allis-Chalmers Tractors.

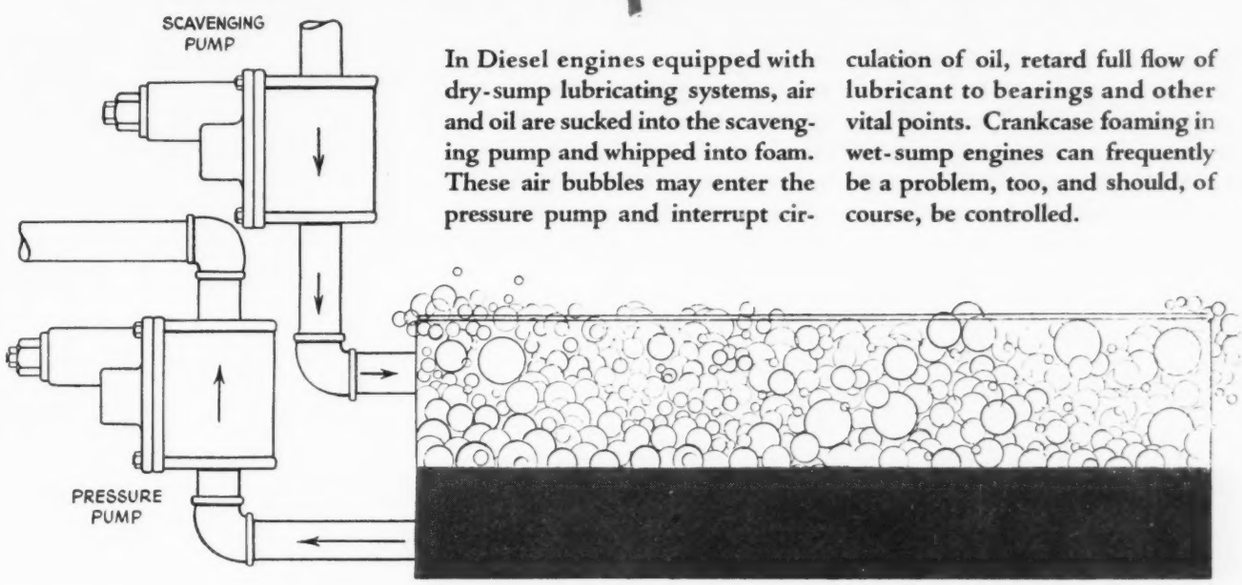
GW ROAD MACHINERY
is Sold Through
ALLIS-CHALMERS
Dealers Everywhere

ROAD MACHINERY DIVISION
GAR WOOD INDUSTRIES, Inc.
DETROIT 11, MICHIGAN

OTHER PRODUCTS OF GAR WOOD INDUSTRIES INCLUDE: HOISTS AND BODIES • WINCHES AND CRANES • TANKS • HEATING EQUIPMENT • MOTOR BOATS

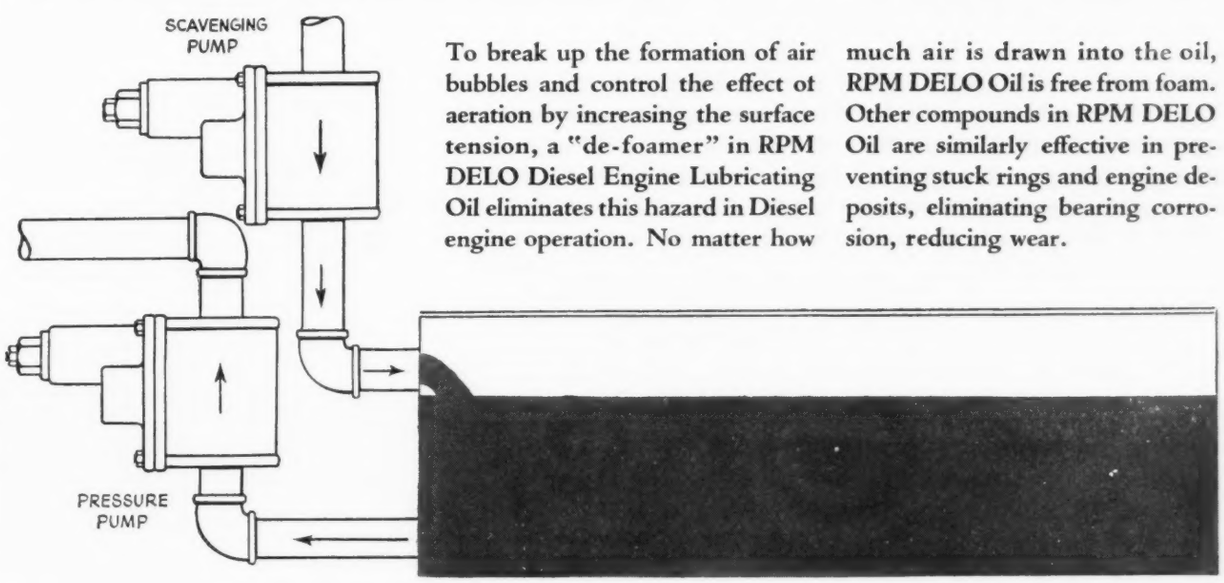
Diesel Engine DANGER points

AIR BUBBLES ENDANGER OIL CIRCULATION



In Diesel engines equipped with dry-sump lubricating systems, air and oil are sucked into the scavenging pump and whipped into foam. These air bubbles may enter the pressure pump and interrupt circulation of oil, retard full flow of lubricant to bearings and other vital points. Crankcase foaming in wet-sump engines can frequently be a problem, too, and should, of course, be controlled.

RPM DELO OIL PREVENTS CRANKCASE FOAMING



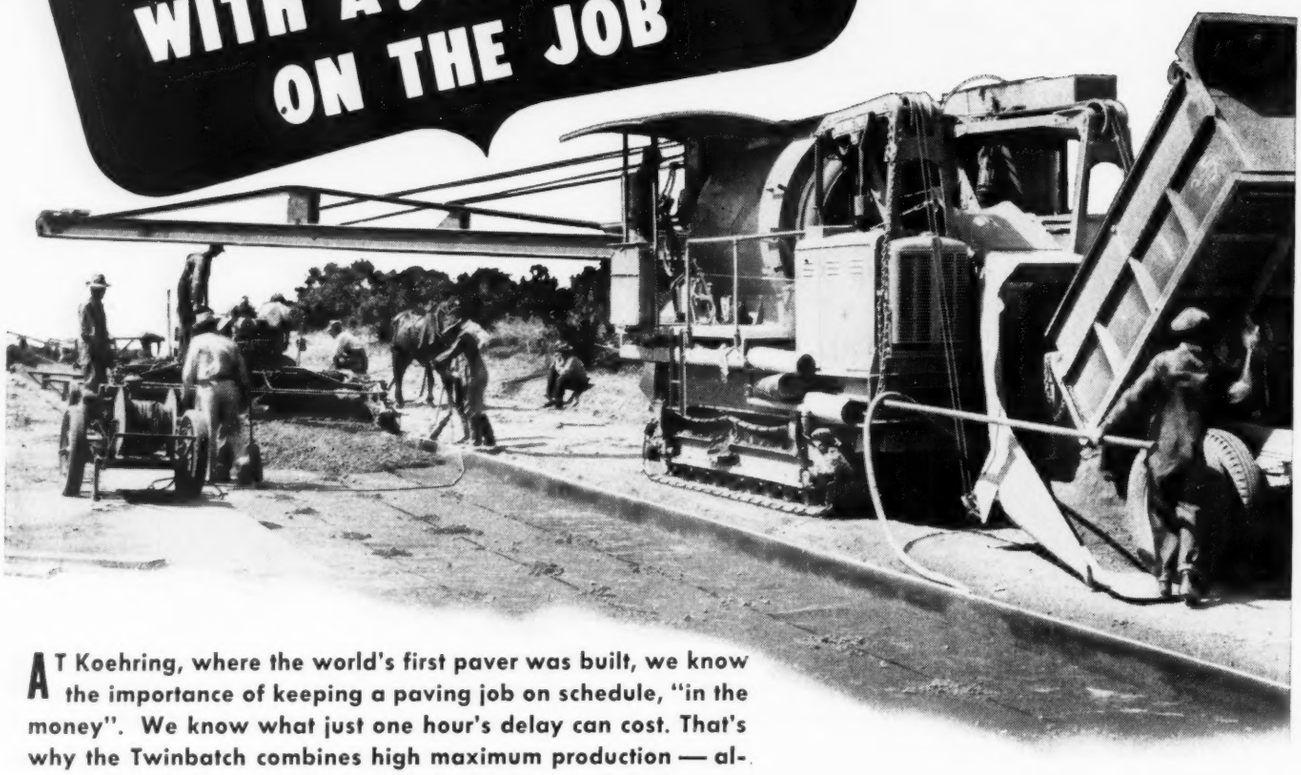
To break up the formation of air bubbles and control the effect of aeration by increasing the surface tension, a "de-foamer" in RPM DELO Diesel Engine Lubricating Oil eliminates this hazard in Diesel engine operation. No matter how much air is drawn into the oil, RPM DELO Oil is free from foam. Other compounds in RPM DELO Oil are similarly effective in preventing stuck rings and engine deposits, eliminating bearing corrosion, reducing wear.

To match the fine performance of RPM DELO OIL, use these equally efficient companion products from the same famous "RPM" line—RPM HEAVY DUTY MOTOR OIL—RPM COMPOUNDED MOTOR OIL—RPM GEAR OILS AND LUBRICANTS—RPM GREASES. For additional information or name of your distributor, write any of the companies below:

STANDARD OF CALIFORNIA · 225 Bush St., San Francisco 20, California
THE CALIFORNIA COMPANY · 17th and Stout Streets, Denver 1, Colorado
STANDARD OIL COMPANY OF TEXAS · El Paso, Texas
THE CALIFORNIA OIL COMPANY · 30 Rockefeller Plaza, New York 20

RPM DELO
DIESEL ENGINE LUBRICATING OIL

NEW ROUTES COME THRU ON SCHEDULE WITH A *twinbatch* ON THE JOB



AT Koehring, where the world's first paver was built, we know the importance of keeping a paving job on schedule, "in the money". We know what just one hour's delay can cost. That's why the Twinbatch combines high maximum production — almost 90 batches per hour, enough concrete to lay down a 1,000 foot slab, 20 feet wide, in four hours — with exceptional Heavy-Duty strength.

HEAVY-DUTY PAVER

Because it's built right for on schedule service, the Twinbatch is a Heavy-Duty machine. Every detail tells a Heavy-Duty story: 16-inch 78-lb. steel I beams make up the main frame. The heavy two-compartment drum has extra alloy liners. Drum roller paths are the heaviest and thickest of any paver.

CONTINUOUS EFFICIENT SERVICE

Because maximum efficiency is safe-guarded by Heavy-Duty construction, high production continues uninterrupted. Unfailing, the Twinbatch sets an efficient, money-making pace for the crew. At the customary 60-batches-an-hour clip, the Twinbatch works smoothly, effortlessly . . . easy on the operator, easy on the crew. When rains cause delays, its top output of 86.7 batches per hour gets the job back on schedule — fast.

KOEHRING

34-E

twinbatch

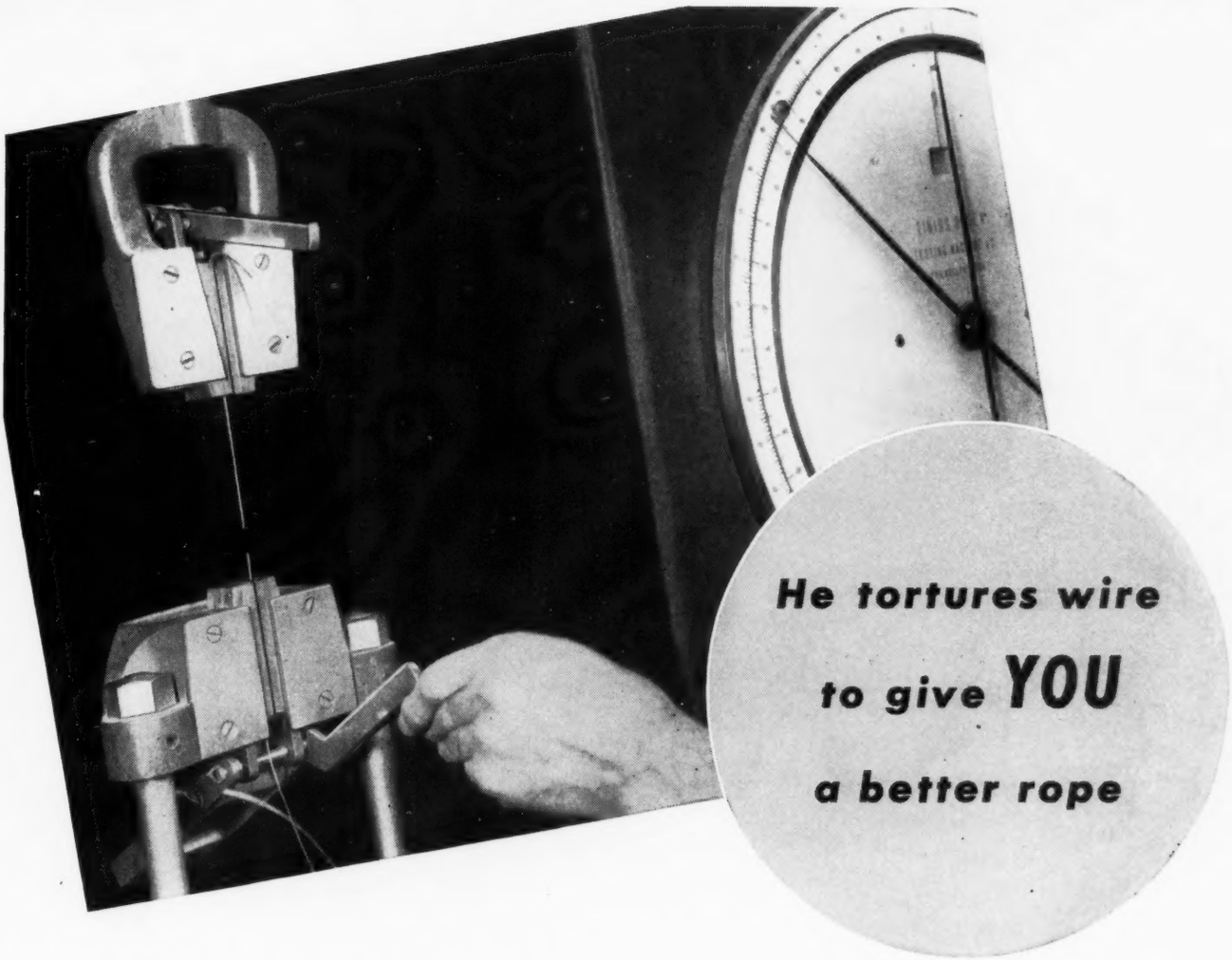
PAVER

TWO COMPARTMENT DRUM

KOEHRING COMPANY • *Milwaukee 10, Wisconsin*

KOEHRING HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT



He tortures wire to give YOU a better rope

This Macwhyte laboratory technician is working in *your* interest. He gives the strength test to samples from each end of every coil of wire we make. Each sample is stretched to the breaking point. If it passes the test, the coil is tagged OK and used for Macwhyte Wire Rope. If not up to standard, the wire is rejected.

To make sure Macwhyte Rope will give you maximum service, the finished wire is also given a torsion or twist test to check its stamina. Granular structure is analyzed by a microscopic camera. Wire samples are rotated in an arc by a special machine that checks their ability to withstand fatigue.

Strict metallurgical control is another reason you can always depend on Macwhyte Wire Rope for long, economical life.

Macwhyte Wire Rope Catalog, G-15. 170 pages. Lists Macwhyte's full line, gives complete manufacturing story. Ask any Macwhyte representative or write Macwhyte Company.

Make MACWHYTE your headquarters for WIRE ROPE and SLINGS

MACWHYTE COMPANY

Wire Rope Manufacturers

2941 ***Fourteenth Avenue, Kenosha, Wisconsin***

Mill Depots: New York · Pittsburgh · Chicago · Minneapolis · Fort Worth
Portland · Seattle · San Francisco · Los Angeles
Distributors throughout the U. S. A. and other countries

★ ★ ★ ★

MACWHYTE PREformed and Non-PREformed Wire Ropes—
Internally Lubricated . . . MONARCH WHYTE STRAND
Wire Rope . . . Special Traction Elevator Rope . . .
Braided Wire Rope Slings . . . Aircraft Cables,
Assemblies and Tie-Rods . . . Stainless Steel Wire Rope,
Monel Metal Wire Rope, Galvanized Wire Rope.

MACWHYTE COMPANY 50th Year 1896 – 1946

GENERAL DEEP CLEAT

Equipped with General Deep Cleat Tires, this Adams Motor Grader is widening and grading near Norton, Kansas.

Best Tire "on earth"

THE GENERAL'S "deep bite" tread was specially designed by America's foremost quality tire engineers to give *maximum traction* on soft ground, mud, sand or gravel.

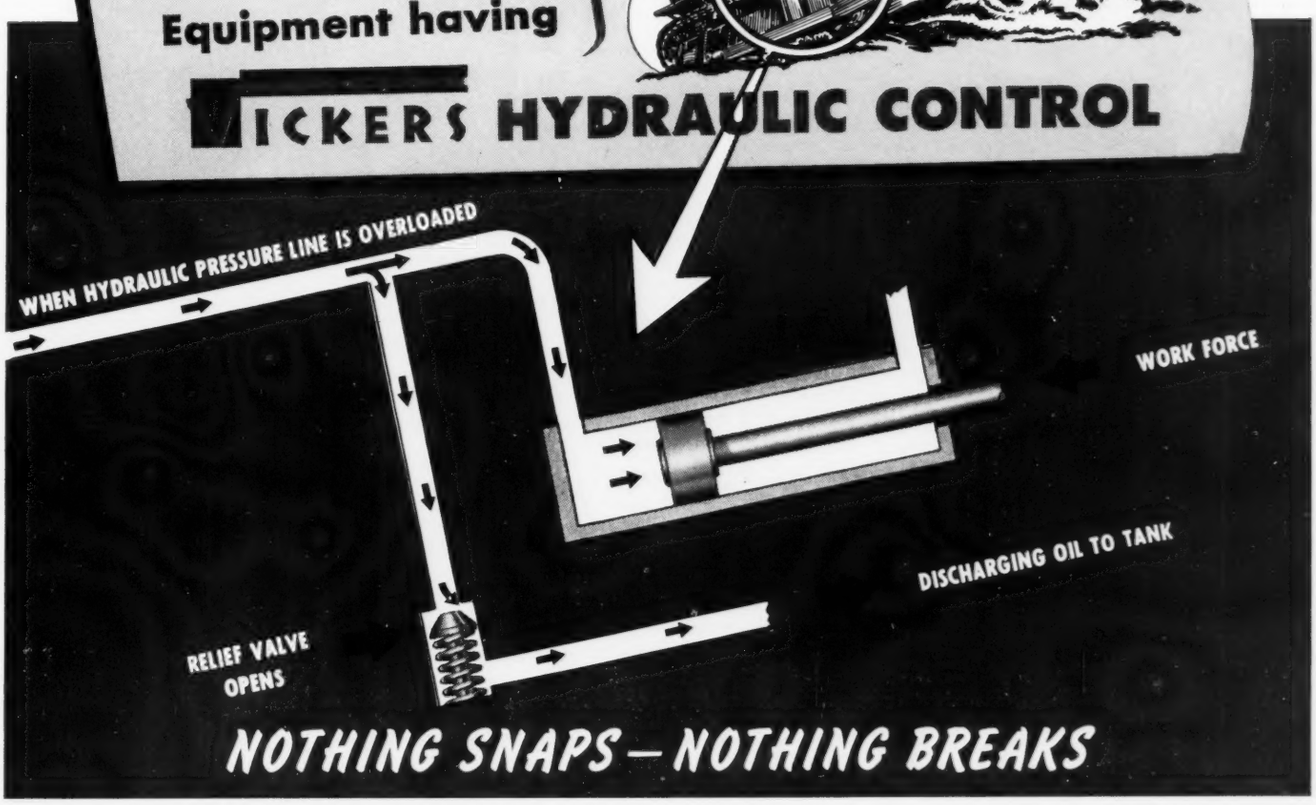
The best tire "on earth"... the General Deep Cleat . . . is self-cleaning . . . built for rugged service with exclusive "shock absorber" construction that resists abuse and service damage.

For longer, low cost tire service, equip driving wheels with General Deep Cleats . . . trailing wheels, too, if all tires are to be interchangeable.

THE GENERAL TIRE & RUBBER CO.
AKRON, OHIO

GENERAL OFF-THE-ROAD TIRES

Overload DOES NOT DAMAGE Construction Equipment having VICKERS HYDRAULIC CONTROL



NOTHING SNAPS—NOTHING BREAKS

Overload protection is *built into* Vickers Power Hydraulic Controls for construction equipment. A relief valve stands guard on each circuit, so when overload occurs, the valve opens—returns oil to the tank—relieving the strain.

Nothing is injured. When the overload is cleared, the relief valve automatically closes, and the circuit is ready to go back to work.

Overload cannot damage equipment having Vickers Power Hydraulic Control—it cannot even cause any inconvenience—the relief valve takes care of it.

The effect of this automatic protection on the life of the equipment is obvious. But there is another advantage—the operator doesn't have to "baby" the machine. He knows there is overload protection—hence he can work as fast and crowd as hard as he likes—an important feature when the "going is tough."

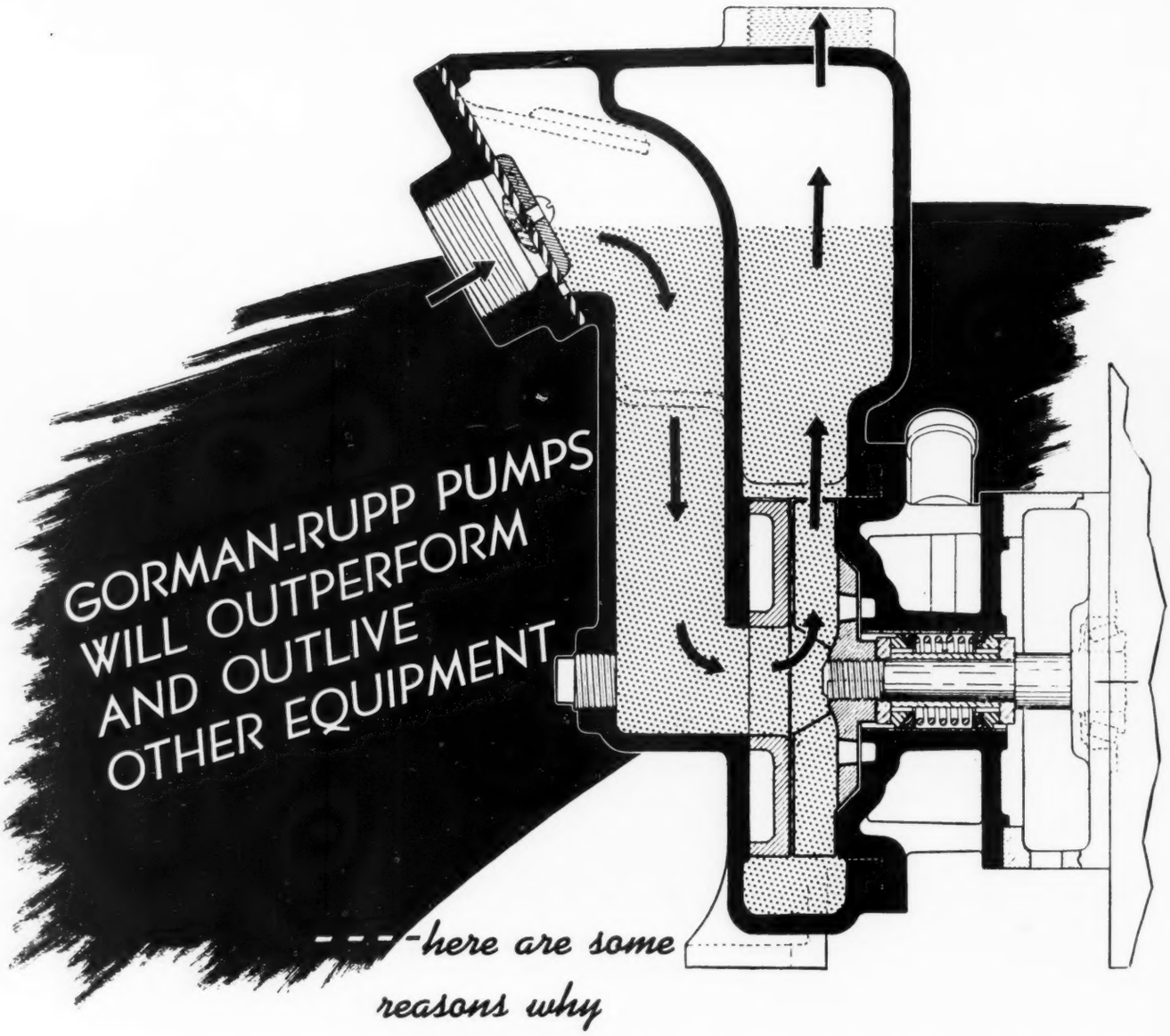
For easier and more accurate control—faster work—specify Vickers Power Hydraulic Controls.

VICKERS *Incorporated*

1494 OAKMAN BLVD. • DETROIT 32, MICHIGAN

Application Engineering Offices: Chicago • Cincinnati Cleveland • Detroit • Los Angeles • Newark • Philadelphia Rochester • Rockford • Tulsa • Worcester

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921



GORMAN-RUPP PUMPS WILL OUTPERFORM AND OUTLIVE OTHER EQUIPMENT

----here are some reasons why

You can't get the real story of a Gorman-Rupp pump from looking at the outside. It's the simplicity and good design inside that makes this the most efficient, trouble-free pump you can get. *There are no by-passes, no pipes, no valves -- nothing to do in priming but start the motor and you start the water. Since such makeshifts rob a pump of as much as 30 per cent of its running capacity, the greater priming simplicity of Gorman-Rupp pumps pays off in more work for less fuel and power.

*Gorman-Rupp pumps are streamlined inside where streamlining counts! Smooth surfaces, no traps and a design that flows with the water adds another big factor to efficiency and prevents clogging. These pumps will handle any muck or solids that will pass the intake and clear them out of the pump body.

*The G-R impeller operates at motor speed, without reduction gears -- another source of wear, trouble and maintenance eliminated. This impeller is the only moving part and rotates on high grade roller bearings.

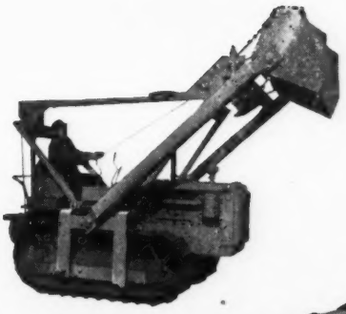
*Every part of a Gorman-Rupp pump has long wear built into it, and every wearing part is replaceable without tearing the pump apart. This maintenance can be done by an unskilled man with common tools.

These are a few reasons why Gorman-Rupp self-priming centrifugal pumps will out-perform and outlive any other comparable equipment. Write for further detailed information.

THE GORMAN-RUPP COMPANY

GORMAN-RUPP PUMPS — UNSURPASSED FOR PUMPING FAST

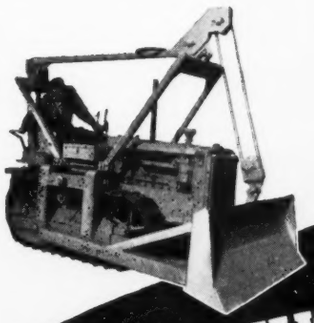
308 BOWMAN STREET • MANSFIELD, OHIO



BULLDOZERS & TRAILBUILDERS

RIPPERS

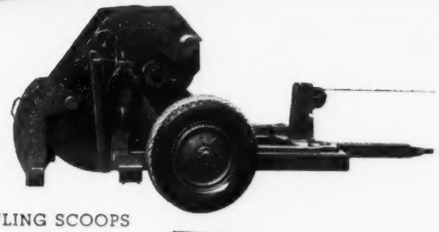
TAMPERS



LOADERS

SOUTHWEST Construction Equipment *for every job!*

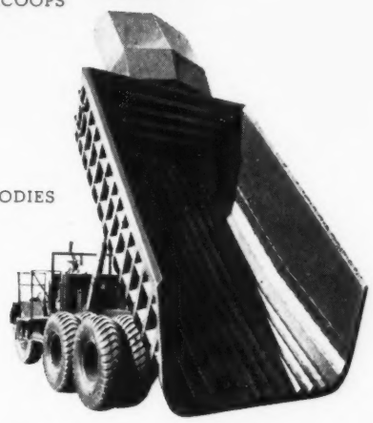
POWER CONTROL UNITS



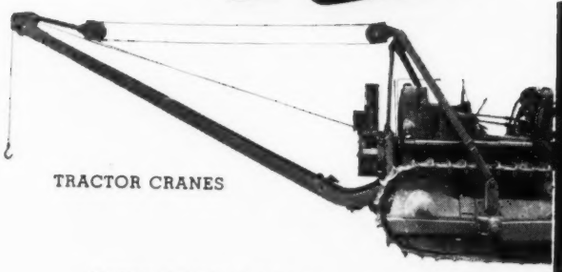
HAULING SCOOPS

Southwest's complete, standardized line affords construction men an opportunity to fill their needs from one dependable source. From start to finish, no matter whether Allis-Chalmers, Caterpillar, International or Cletrac tractors are used, an economical Southwest unit is available to bring you increased profits.

In addition to the standard line, special Southwest Dump Wagons, Tampers, Heavy Duty Compaction Units, etc., are giving outstanding performance on out-of-the-ordinary jobs all over the country . . . Why not let Southwest help solve YOUR problems?



DUMP BODIES



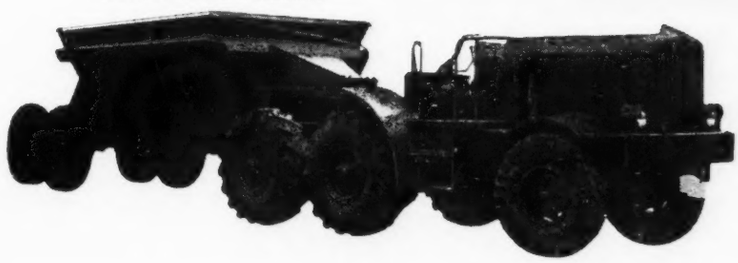
TRACTOR CRANES

CONSTRUCTION MACHINERY DIVISION

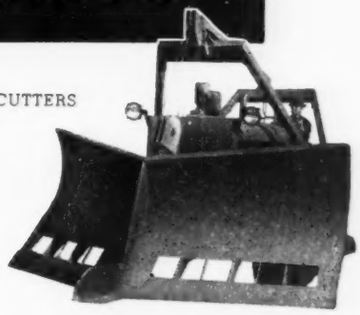
Southwest Welding & Manufacturing Company

ALHAMBRA, CALIFORNIA

BOTTOM DUMP WAGONS



BRUSHCUTTERS



CONTRACTORS

HERE ARE FACTS ABOUT FINANCING CONSTRUCTION EQUIPMENT

When you buy one or more pieces of equipment, C.I.T. WILL FURNISH THE FUNDS to complete the transaction.

Let the equipment help pay its own way while completing your contracts. Conserve your working capital for supplies, payrolls, operation purposes.

It's easy to arrange C.I.T. financing. Tell us what you want to buy . . . what it costs . . . how you wish to pay the balance . . . we'll handle all details promptly and arrange terms to suit your needs . . . AT LOW COST.

WE FINANCE

SHOVELS
CRANES—DRAGLINES
TRACTORS
BULLDOZERS
SCRAPERS—GRADERS
MIXERS—CRUSHERS
COMPRESSORS
TRUCKS
ENGINES
ELECTRICAL EQUIPMENT
Many other types of Construction Equipment

Any of these offices will be happy to serve you. Write, wire or call for full information about C.I.T. financing.

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660 Market Street
SAN FRANCISCO, CALIF.

CIT

The Mark of LEADERSHIP

C.I.T. CORPORATION

INDUSTRIAL FINANCING

333 N. Michigan Avenue
CHICAGO, ILL.

•

626½ So. La Brea Avenue
LOS ANGELES, CALIF.

In Canada: CANADIAN ACCEPTANCE CORPORATION *Limited, Metropolitan Building, Toronto, Canada*

AFFILIATED WITH COMMERCIAL INVESTMENT TRUST INCORPORATED

P&H TRUCK CRANES

Here's High Speed Travel ...and Greater Work Capacity

- There's no compromise between mobility and work-ability on P&H truck cranes. With their *dual power* you have no half-way measures.

YOU TRAVEL with an engine that's *built for travel,* geared for it! Across town or across state, you can drive at regular traffic speeds.

YOU WORK with another engine *designed* for that job. It's the right power for unhampered *load handling ability*—greatest possible capacity.

Whether it's crane, dragline, shovel or other work, P&H's *dual powered* units enable you to handle a wider range of work and to do it faster, at lowest cost. Write for literature.

"Size for size, no P&H truck crane has ever been out-lifted."

P&H *Added Values*

- *Hydraulic control*—a new peak in operating ease and safety.
- *Greater stability*—with exclusive torsion bar-mounted front axles and lower center of gravity.
- *Independent Planetary boom hoist*—raises or lowers boom smoothly, with or without load.
- *Planetary load lowering*—permits "inching" of loads, accurately.
- *All-welded construction*—greater strength. Weave-proof frame eliminates sway at boom point.

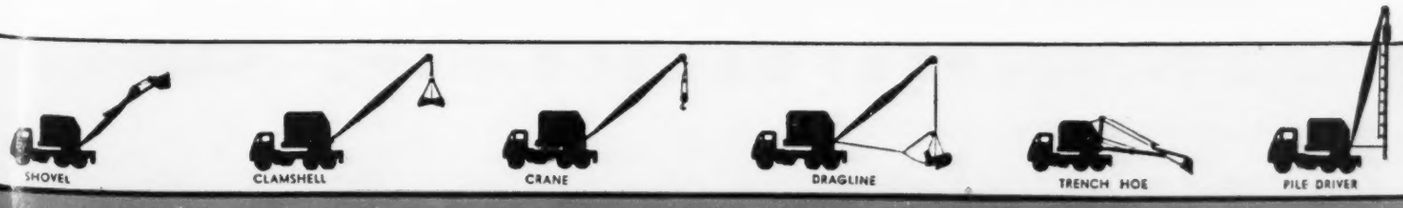
P&H REMOTE CONTROL AVAILABLE

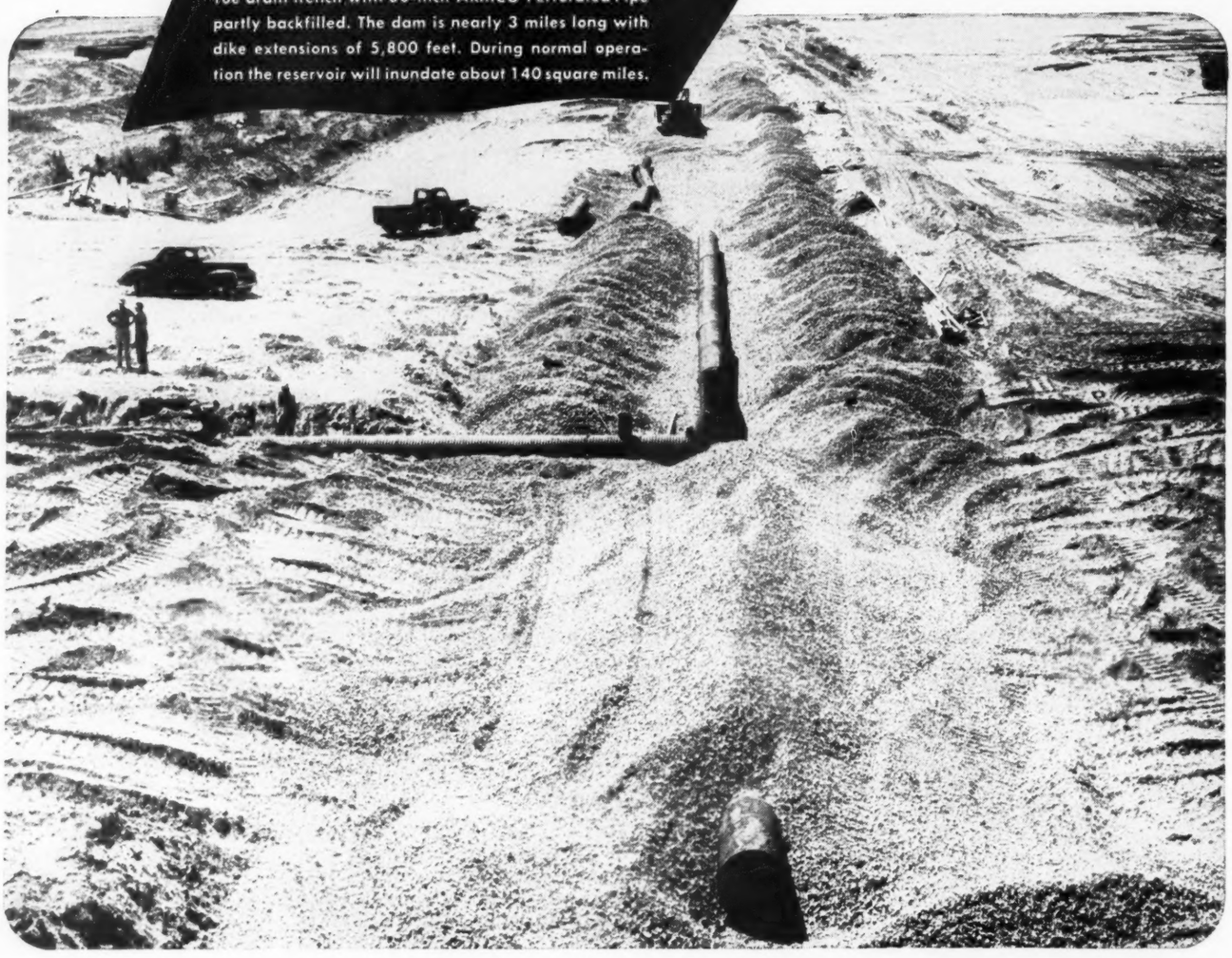
With this unit you can control all carrier movements (including the horn) by electric push button from operator's position inside crane cab.

HARNISCHFEGER CORPORATION

ELECTRIC CRANES • EXCAVATORS • ARC WELDERS P&H HOISTS • WELDING ELECTRODES • MOTORS

General Offices: 4494 W. National Ave., Milwaukee 14, Wis.





Toe drain trench with 30-inch ARMCO Perforated Pipe partly backfilled. The dam is nearly 3 miles long with dike extensions of 5,800 feet. During normal operation the reservoir will inundate about 140 square miles.

THIS PIPE GUARDS A DAM AND 2 BILLION GALLONS OF WATER

At each junction of mains and laterals a corrugated metal manhole, reducing from 48 to 24 inches in diameter, provides access for cleanouts and inspections.

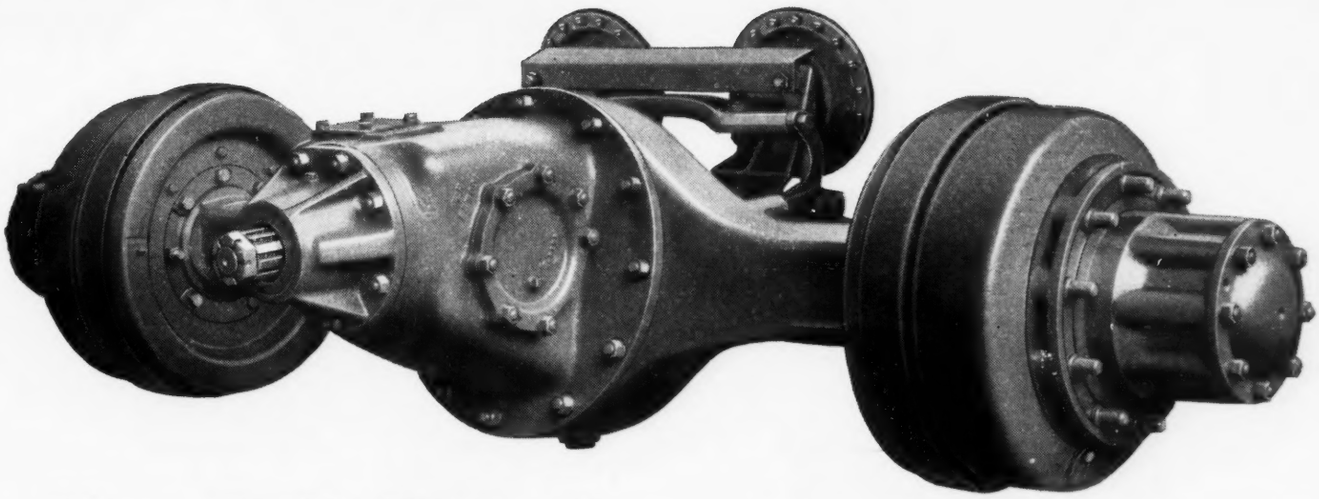
Here's how engineers employed an Armco subdrainage system to protect one of the world's largest rolled-fill earthen dams nearly 3 miles long.

The 30-inch ARMCO Perforated Pipe was installed under the dam with 12, 18, 24 and 30-inch laterals and outlets. By intercepting seepage water resulting from hydrostatic pressure, the system effectively prevents uplift or boiling on the downstream side.

Installation was easy, thanks to the lightweight and freedom from breakage of ARMCO Pipe. Tight joints, so essential to the safety of the dam, were assured by Armco's method of joining long pipe lengths with sturdy band couplers.

You'll find an Armco subdrainage system indicated wherever harmful ground water must be removed to keep subgrades firm and stable. ARMCO Pipe has proved its ability to resist crushing, cracking or disjointing under the impact and weight of heavy loads. Efficiency remains high because there is less chance of silting or clogging. Write today for complete information. Armco Drainage & Metal Products, Inc., and Associated Companies, 1325 Curtis St., Middletown, Ohio.

ARMCO
PERFORATED PIPE



New S&U 200 Series

Single-Speed Double-Reduction*

New hypoid-helical double-reduction drive . . . new torsion-flow "Axaloy" axle shafts . . . new 9-16 tooth combination differential . . . new interjacent pinion shaft location . . . plus scores of other modern features. Data on ALUMINUM housing, brake shoes and hubs on S Series for weight saving available upon request.

READY NOW!

TWO NEW HEAVY-DUTY AXLES!

Two new tough-as-nails Timken axles are ready to help you whip your heavy-duty hauling problems—the new S and U-200 Single-Speed Double-Reduction Axles and the new S and U-300 2-Speed Double-Reduction Axles.

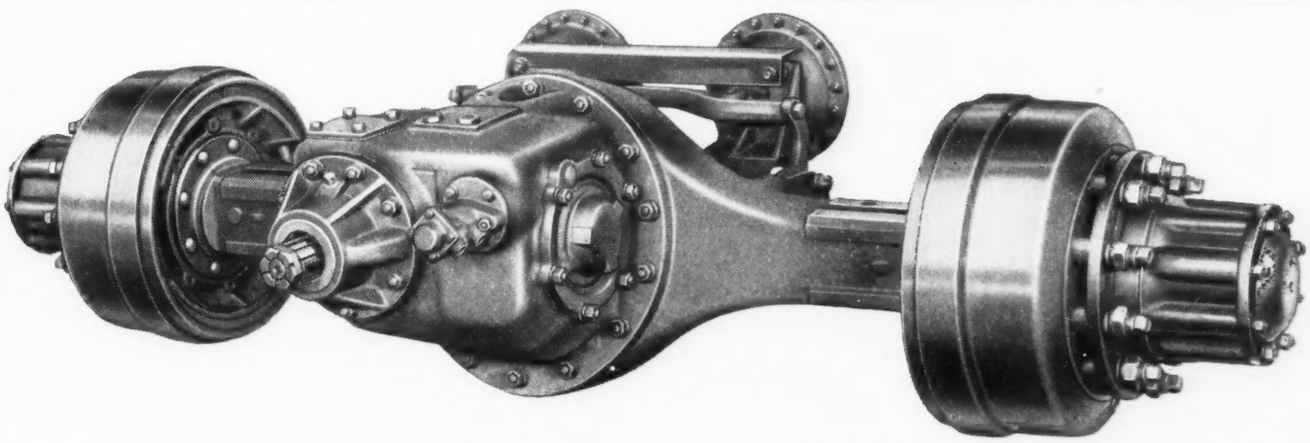
Both are designed for modern high-power engines—the S Series for loads over 18,000 pounds, and the U Series for heavier loads and off-the-road operation. Both are bears for punishment—have more up-to-the-minute features than you can shake a prop shaft at. Both are in *full production now*—the only postwar heavy-duty axles ready to pitch in and start working for you immediately.

Operators who are using these new axles call them the *final answer to heavy-duty final drive problems.* For all that's modern and best in design and performance, specify Timken S or U Series Axles under the next heavy-duty trucks you buy.

The Accepted TIMKEN AXLES Standard

TIMKEN AXLES

THE TIMKEN-DETROIT AXLE CO., DETROIT 32, MICH.
WISCONSIN AXLE DIVISION • OSHKOSH, WIS.
TIMKEN AXLE BRAKE DIVISION • DETROIT 32, MICH.

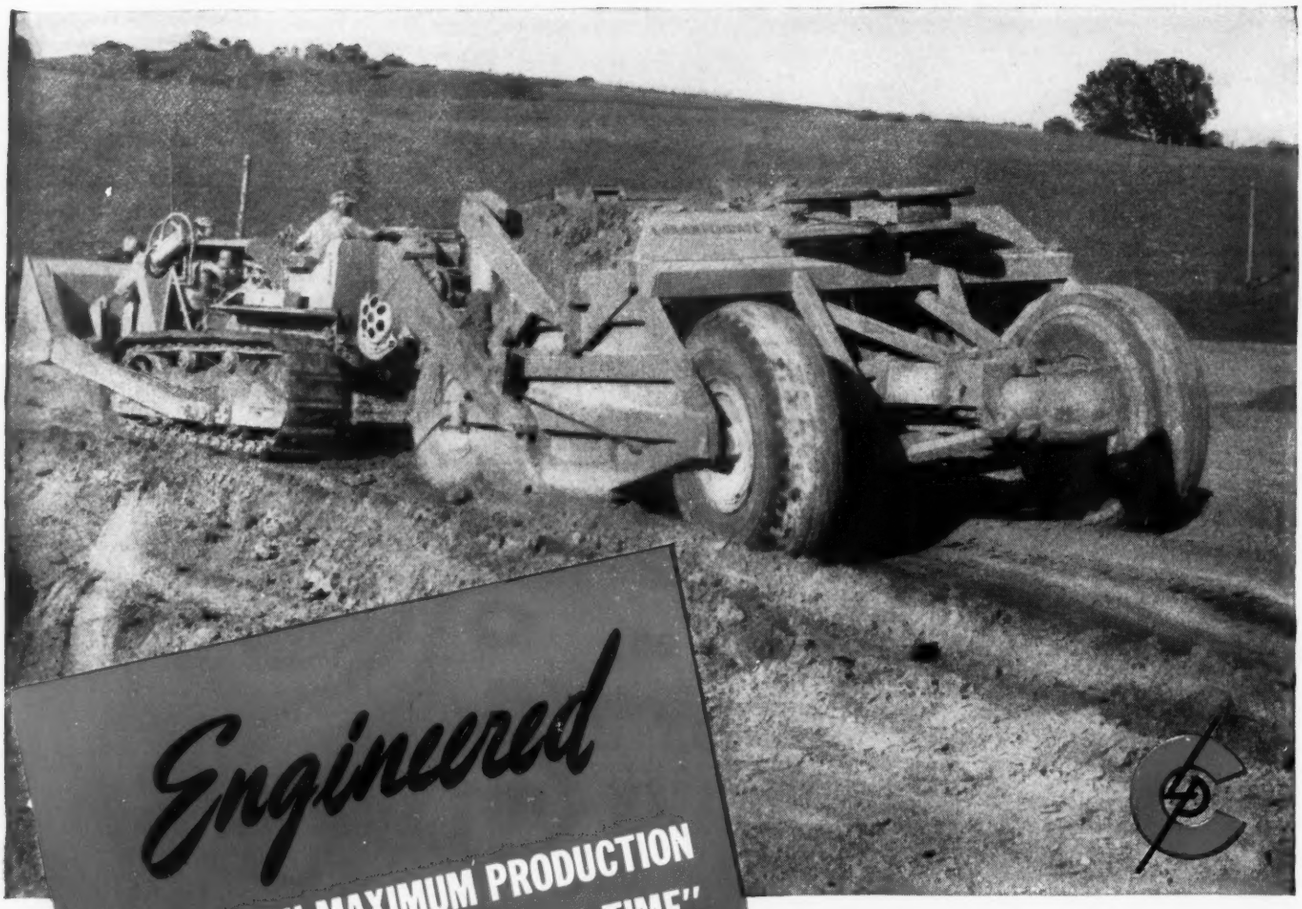


New S&U 300 Series

2-Speed Double-Reduction*

2-speed double-reduction drive doubles available gear combinations—gives greater pulling power and high road speeds in same truck. Equipped with famous Timken Easy Power Shift—no manual shifting required. Like S and U-200, S and U-300 offer option of new DP Heavy-Duty Hydraulic Brake or famous P Series Power Brake.

***FINAL DRIVES INTERCHANGEABLE IN THE SAME AXLE HOUSING**



Engineered

TO GIVE YOU MAXIMUM PRODUCTION WITH A MINIMUM OF "DOWN-TIME"

6 MORE REASONS WHY IT PAYS TO OWN AN LPC "CARRIMOR"

1. **Built to "Take it"** — Sturdy welded steel box beam construction plus curved bowl bottom assure plenty of strength without excess weight.
2. **Easy on Cable** — Fewer sheaves plus correct reeving mean increased cable efficiency, longer cable life. Less cable is also required than with competitive models.
3. **Simplified Design** — Gives you interchangeable parts and simplest mechanical movements without "gadgets." All sheaves located where they won't be knocked off or collect dirt.
4. **Improved Axles** — Heavy duty type, adjustable vertically and supported at both ends for proper load distribution and easy removal.
5. **Long Wearing Parts** — Special heat treated steel. Cutting edge is hard-faced, self sharpening and reversible for extra utility. King pin assembly adjustable to eliminate "pounding."
6. **Easy to Service** — All working parts quickly accessible. Wheels and bearings fitted for pressure greasing—wheel bearings easily adjusted without removing wheels.

IN every competitive loading and dumping test to date, the new LaPlant-Choate "Carrimors" have consistently proved their ability to *outperform* other scrapers by a wide margin. But that's only the beginning of the *plus* values you get in these greatly improved LPC outfits. In addition, they have been made stronger, lighter in weight, easier to service on the job. Consequently, you can count on more hours of profitable production, with a minimum of "down-time" for upkeep and repairs. Better see your LaPlant-Choate distributor right away for complete facts on the 8 and 14-yard models. They're going like "hot-cakes!" **LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa; Oakland, Cal.**

LaPLANT-CHOATE

Job-Proved Equipment... for Lowest Possible Cost in Moving Earth

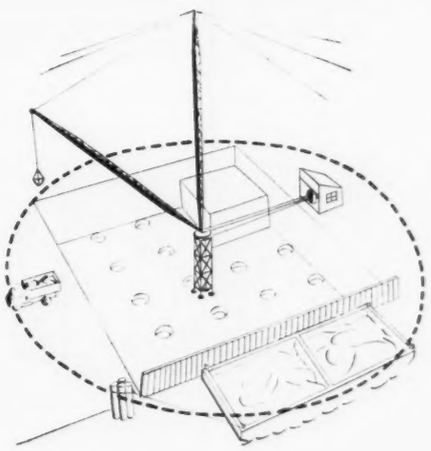
DO IT WITH A DERRICK...

AND SAVE!

Don't invest in expensive materials-handling methods for jobs where an "American" Hoist and Derrick will do just as well . . . and for thousands of dollars less. Furthermore, there are hundreds of jobs where derrick methods are even more efficient.

"American" Derricks are engineered for easy and safe operation and moving. They're built to meet the exacting demands of modern high-speed handling. They have large reserves of strength to meet *all* stresses—load-lifting, wind pressure, impact, slewing, whipping of lines, eccentric loading, mast out of vertical, etc. "American" makes stiff-leg, guy rope, gallows frame, tower, barge and steel erecting types—all backed by 60 years' experience.

See your "American" Distributor or write direct. We also build top-performance hoists up to 25,000 lbs. capacity, and blocks and sheaves for equipment manufacturers and users . . . all moderately priced.



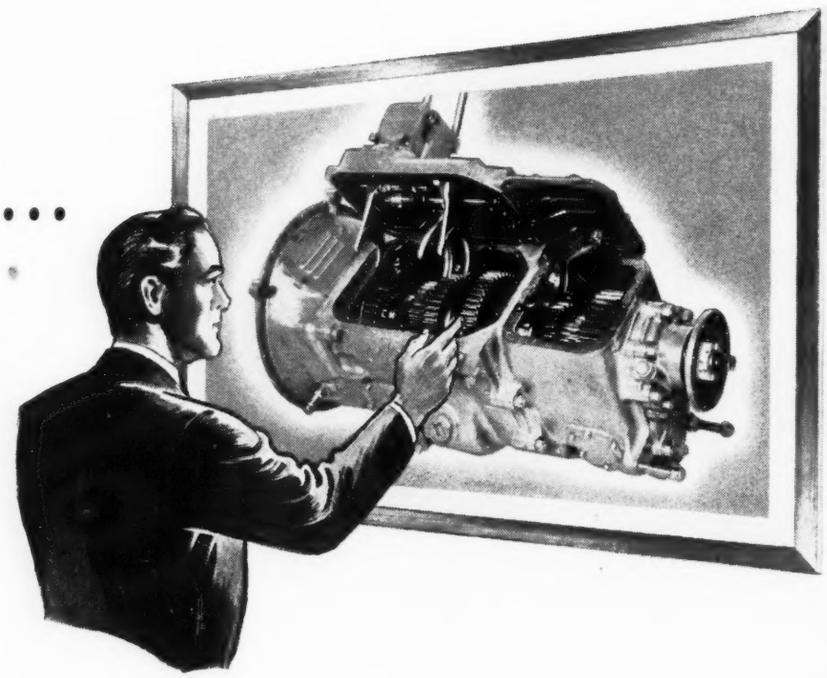
AMERICAN
HOIST & DERRICK CO.

St. Paul 1, Minnesota

CHICAGO NEW YORK SAN FRANCISCO

REVOLVERS LOCOMOTIVE CRANES HOISTS DERRICKS BLOCKS AND SHEAVES CROSBY CLIPS

That's right... this unusual motor oil will also reduce transmission trouble



Stanolube HD

Transmissions in heavy duty bus and truck service often run as hot as crankcases—or hotter. Heat and agitation of any lubricant cause oil oxidation. Just as oil oxidation in the engine results in varnish formation on pistons and cylinders, so does it cause varnish and sludge in gear cases.

Stanolube HD contains both an oxidation inhibitor and a detergent. It resists the formation of oil oxidation products and also keeps these and other contaminants from settling out of the oil.

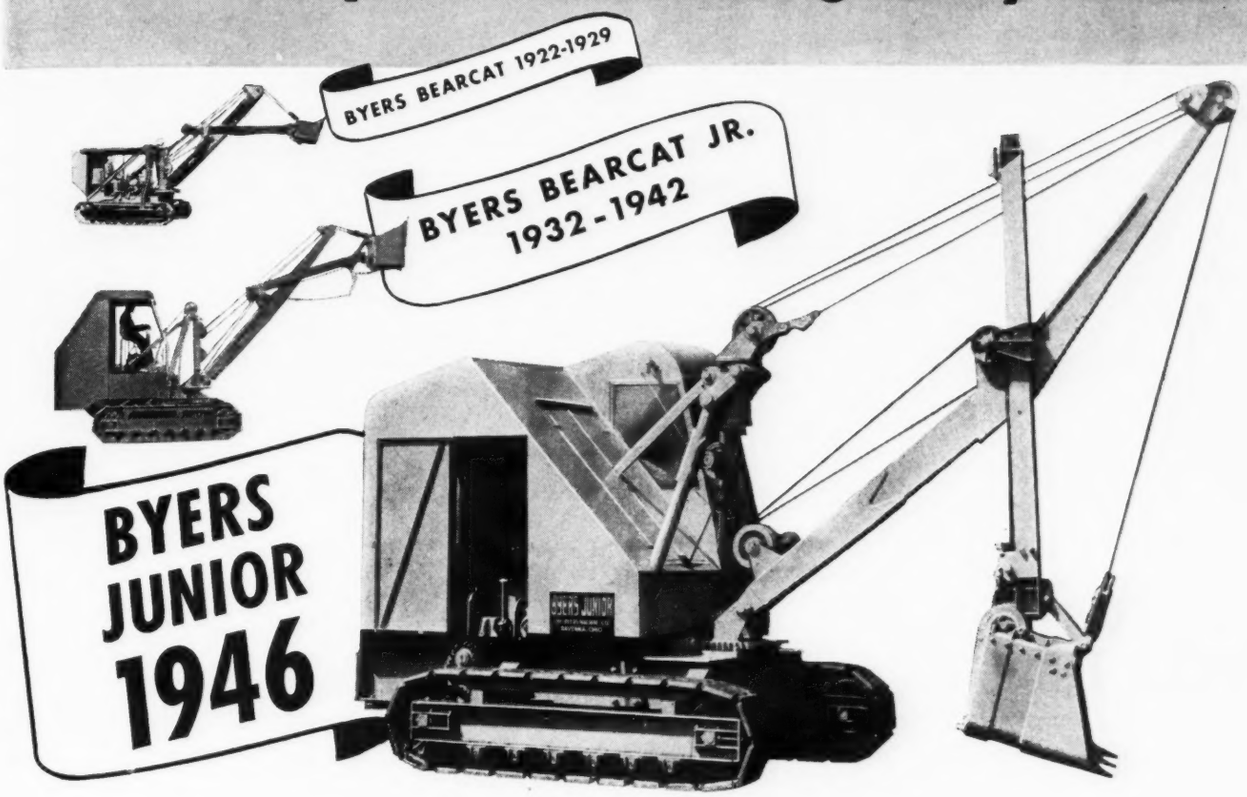
Fleet records show that Stanolube HD eliminates varnish and other deposits in both engine and transmission. It also contains an anti-foam agent which eliminates troublesome foaming. If you are having trouble with transmission failures, let a Standard Oil Automotive Engineer analyze your problem. He can tell you the SAE grade of Stanolube HD you need, the grade that is comparable with the gear lubricant you now use. Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE

... Now comes the

THIRD GENERATION

of Byers Partial Swing Utility Shovels



For those plentiful excavating and material handling jobs of smaller size, you will want the new ⅜-yd. partial swing Byers "Junior" shown here.

Byers Junior is a modern designed excavator throughout, built for heavy duty ⅜-yd. work of every kind. Its low cost of operation and maintenance, its easy portability and the wide variety of work it does fast and easily, add up to economy and profit.

ECONOMY for state, county, township and municipal users.

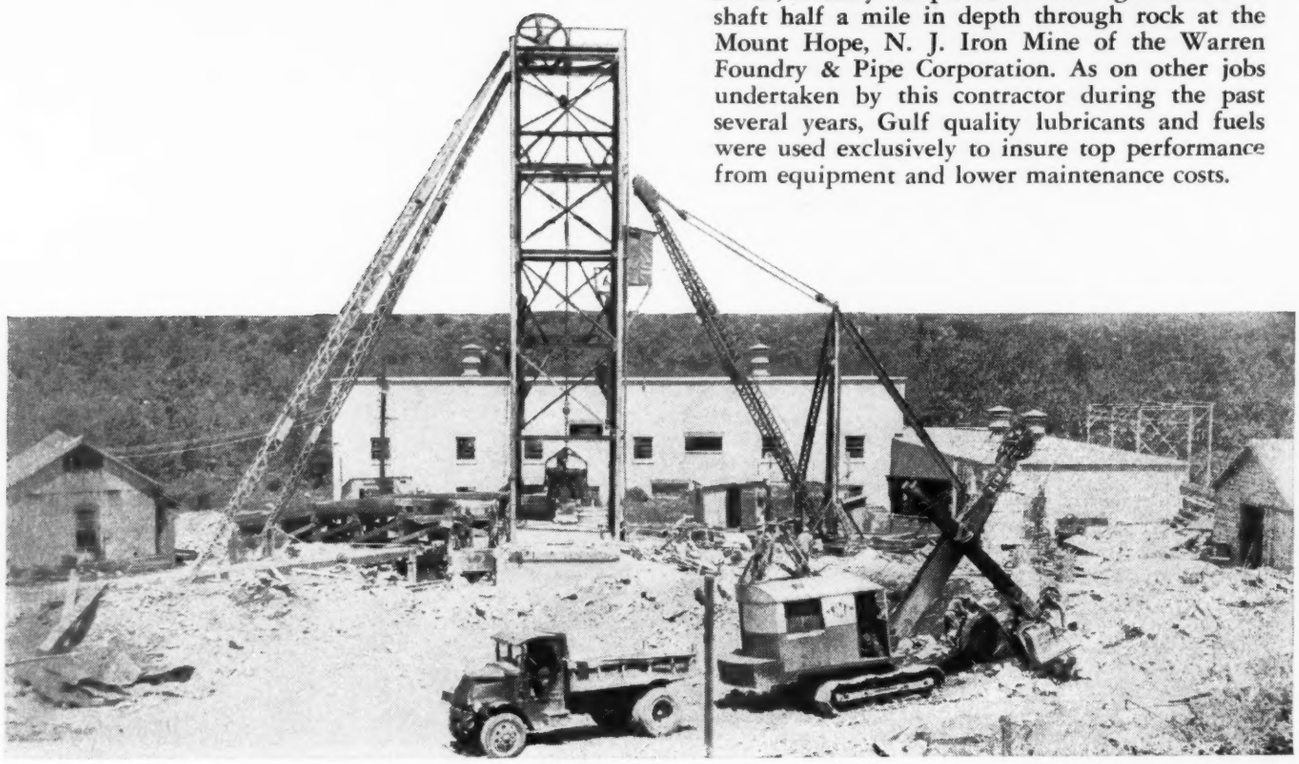
PROFIT for contractors who need a sturdy ⅜-yd. shovel, crane, dragline or back hoe.

The Junior is not an old design modernized. All of Byers' many years of experience with the original Bearcat and the popular Bearcat Junior are embodied in a more rugged "super" design for this 1946 Junior that has been thoroughly tested, proved and approved.

Write for catalog that shows important construction features, improvements and specifications.

THE BYERS MACHINE CO., RAVENNA, OHIO • *Distributors throughout the world*

BYERS 3/8 Yd. JUNIOR



Underpinning & Foundation Co., Inc., New York, N. Y., recently completed the sinking of a vertical shaft half a mile in depth through rock at the Mount Hope, N. J. Iron Mine of the Warren Foundry & Pipe Corporation. As on other jobs undertaken by this contractor during the past several years, Gulf quality lubricants and fuels were used exclusively to insure top performance from equipment and lower maintenance costs.

"GULF QUALITY PRODUCTS AND FINE SERVICE

help us get better job performance from equipment, lower maintenance costs"

says Superintendent Luther Curtis

Underpinning & Foundation Co., Inc., like many other leading contractors, has a proven formula for keeping equipment in good condition and operating efficiently: Gulf quality petroleum products, plus regular attention. This formula has paid big dividends over a period of many years.

On all types of construction jobs, Gulf quality lubricants and motor fuels help contractors do a speedier, more profitable job. They work as a team to insure top-notch equipment performance, fewer delays, and lower maintenance costs.

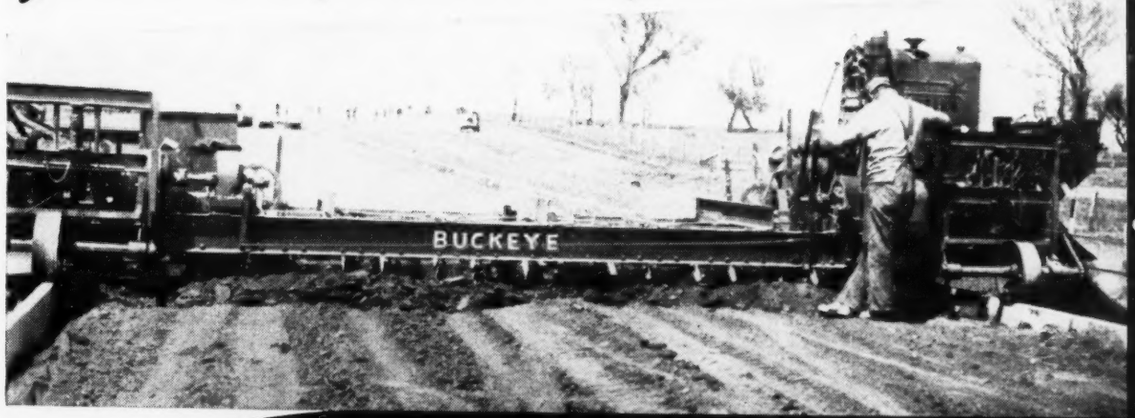
Write, wire, or phone your nearest Gulf office today and arrange to use Gulf quality lubricants and fuels on your next job. They are quickly available to you through 1200 warehouses located in 30 states from Maine to New Mexico.

GULF OIL CORPORATION
GULF REFINING COMPANY
Division Sales Offices:
Boston · New York · Philadelphia
Pittsburgh · Atlanta · New Orleans
Houston · Louisville · Toledo

GULF

Buckeye R-B FINEGRADERS

Give the paver a green light!



Above — Finegrader equipped with overpass permits use of roadway for access to paver. Truck going over Finegrader has load of forms being moved ahead.

The Buckeye R-B Finegrader is set at the exact road cross section. The pickaxe action loosens extra material left by rough grading. The cutting element leaves undisturbed the hard, compact base below the theoretical grade. Low spots are automatically filled.

The Buckeye R-B Finegrader prepares subgrade accurately in one operation. Under most conditions, it can prepare enough subgrade in 5 or 6 hours to keep the paver busy for 8 or 9 hours. Besides keeping subgrade preparation 'way out in front of the paver, it offers the following advantages to contractors on street, highway and airport jobs:

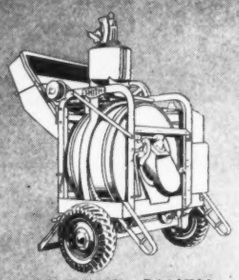
- √ Eliminates need for accurate rough grading.
- √ Keeps subgrade accurately at finegrade line.
- √ Establishes finegrade to the exact cross section.
- √ Operated by one man or one man and helper.
- √ Prepares subgrade so accurately loss of yield can be cut to 1% or less.
- √ Insures against excessive liability through thin cores.
- √ Removes extra dirt left by rough grading.
- √ Deposits extra dirt on either or both shoulders, cutting cost of shoulder finishing.
- √ Operates efficiently under any soil conditions from sticky gumbo to rock laden top soil.

They "up" profit on every contract. Check with your nearest Buckeye dealer or write for Buckeye R-B Finegrader Bulletin.

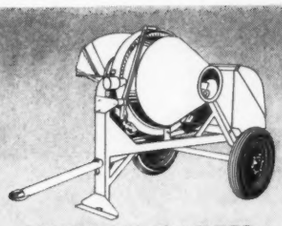
BUCKEYE TRACTION DITCHER COMPANY
FINDLAY, OHIO

built by **Buckeye**

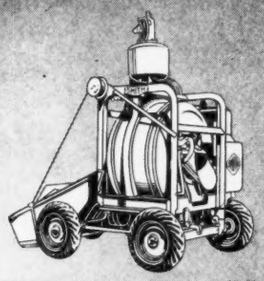
CONVERTIBLE SHOVELS — BULLDOZERS — ROAD WIDENERS
TRENCHERS — MATERIAL SPREADERS — R-B FINEGRADERS



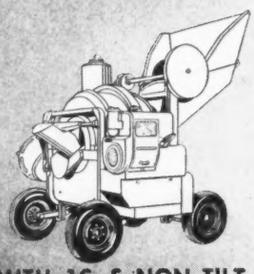
7-S TRAIL-SMITH



SMITH 3½-S TILTER



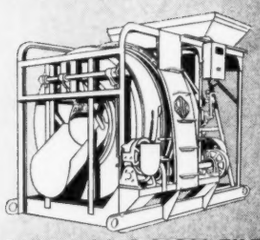
SMITH 11-S NON-TILT



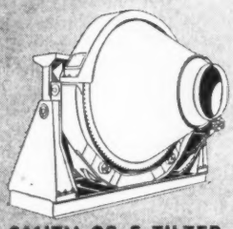
SMITH 16-S NON-TILT

SMITH

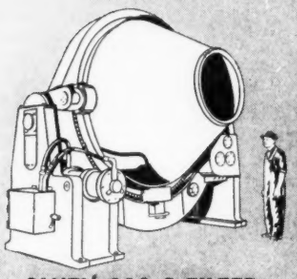
THE T. L. SMITH CO. MILWAUKEE, U.S.A.



SMITH 28-S NON-TILT



SMITH 28-S TILTER



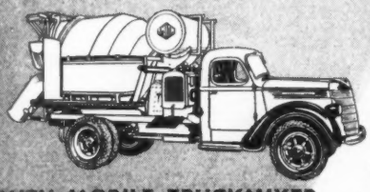
SMITH 112-S TILTER

at the

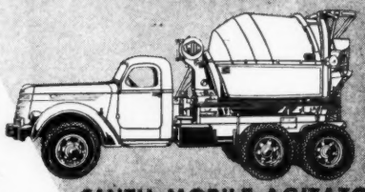
PEAK

of almost a

HALF CENTURY of MIXER LEADERSHIP



SMITH-MOBILE TRUCKMIXER



SMITH-MOBILE AGITATOR

You can select a Smith Mixer or Smith-Mobile Truck Mixer with assurance that it is the finest machine of its kind available. For back of every Smith is a rich heritage of mixer building experience and satisfactory performance.

At the turn of the century, the late Mr. Thomas L. Smith invented the first duo-cone drum, tilting type, concrete mixer. It was an excellent machine, though only the forerunner of the famous Smith line of concrete mixers that has made history in the construction industry. Every year, new improvements and refinements were added, resulting in greater convenience, speed and efficiency.

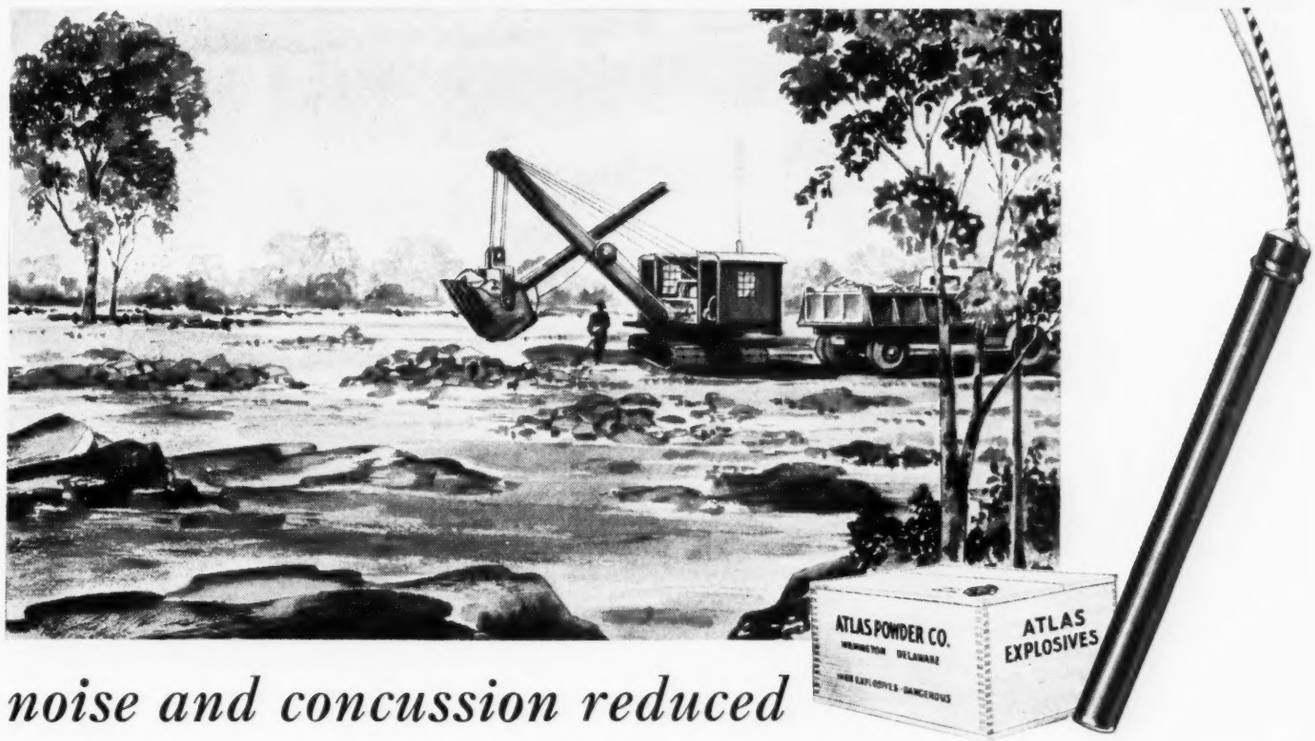
Today, Smith is the acknowledged leader in the industry. And the demand for Smith mixers is increasing by leaps and bounds. There are still some sizes available for prompt shipment and deliveries of other models are being stepped up as fast as possible. So be sure to write for descriptive literature.

The T. L. SMITH COMPANY

2851 N. 32nd STREET, MILWAUKEE 10, WISCONSIN, U. S. A.

LEADER IN THE CONSTRUCTION INDUSTRY SINCE 1900

Never such breakage as with
ATLAS ROCKMASTERS



noise and concussion reduced

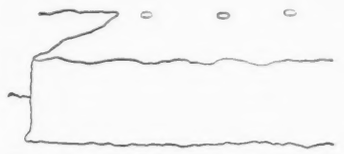


FIG. A—Alternate holes are loaded with "A" Rockmasters and with "B" Rockmasters.

FIG. B—Detonation of "A" Rockmasters places rock under tremendous tension—*almost* to the breaking point.

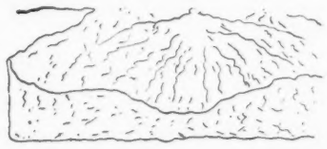


FIG. C—Split-seconds later, the "B" Rockmaster completes the job—*thoroughly* shatters the rock.

Unusual rock formation caused a lot of breakage trouble on a recent airport job.

The formation consisted of a layer of hard rock, some three or four feet thick, under which was softer rock. To obtain the required grading, bore holes had to be put down into this lower strata. When the blast was set off, however, large slabs of stone were turned up that had to be redrilled and blasted.

The problem was solved by a system of controlled time blasts—the basic principle of the Atlas Rockmaster Blasting System. Instead of detonating the charge all at once, a series of delayed impulses was set up. Instantly fragmentation was improved. That's what the Atlas Rockmaster does in nine blasting jobs out of ten. It gives much better breakage. Moreover, noise and concussion are drastically cut down and back break is also reduced.

Can Atlas Rockmaster improve operations for you, too? With your knowledge of the job, and our knowledge of explosives, the answer is probably yes. Let the Atlas representative show you how the Rockmaster works. Remember that it also gives you

the greater safety of

ATLAS MANASITE DETONATORS

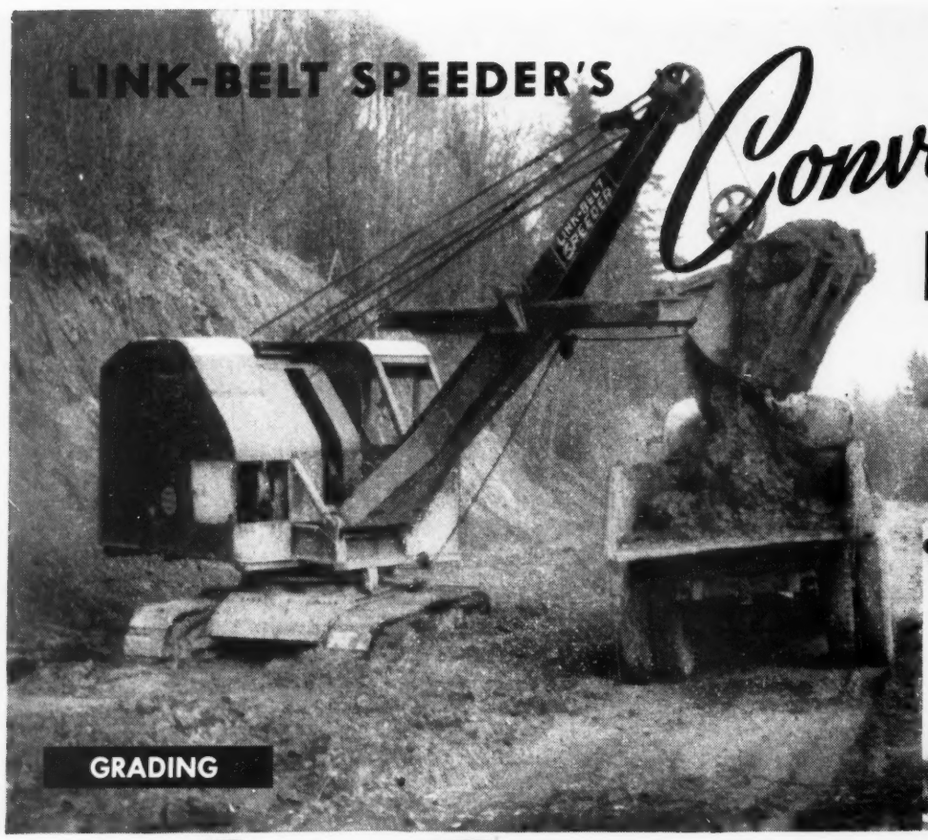
ATLAS EXPLOSIVES

"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington 99, Del. • ***Offices in principal cities*** • ***Cable Address—Atpowco***

LINK-BELT SPEEDER'S *Convertibility* PAYS OFF

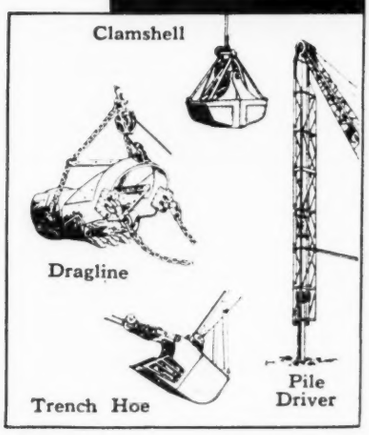


GRADING

RIGHT DOWN THE LINE

DITCHING

TRENCHING



in Road Building

ONE MACHINE PERFORMS ALL OPERATIONS!

You can do more work, more KINDS of work, more of the time, with a Link-Belt Speeder "shovel-crane" because it is quickly, easily convertible to any earth moving or handling operation.

Look at the variety of jobs illustrated here, all connected with road building — all done with the same standard Link-Belt Speeder, with interchangeable front end attachments.

No wonder contractors, highway departments, municipalities are considering a LINK-BELT SPEEDER in their future plans.

For Prompt, Efficient, Convenient Sales and Service:
There is a Link-Belt Speeder Distributor Located Near You

10,284

LINK-BELT SPEEDER

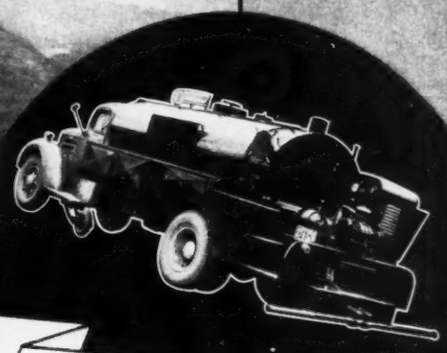
Builders of the Most Complete Line of
SHOVELS-CRANES-DRAGLINES

LINK-BELT SPEEDER CORPORATION, 301 W. PERSHING ROAD, CHICAGO 9, ILL.
(A DIVISION OF LINK-BELT COMPANY)

★ *Let's keep America* ★ AHEAD ★ ON GOOD ROADS!

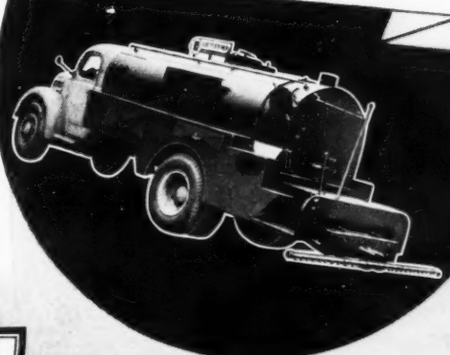
YOU'LL NEVER SEE A DISTRIBUTOR OPERATE AS EASILY AS A "SPRAY MASTER"

With Vacuum-Flow Full Circulating Spray Bar, the "Spray Master" sprays material at desired Spray Bar Width.



Above—"Spray Master" with Standard 2" tubular spray bar with engine mounted at the Rear.

Below—Front engine "Spray Master" with controls at rear. Choice of Front or Rear Engine can be had.



The "Spray Master" will apply Bituminous material to any Road, Street or Highway with the least amount of effort and at less operating cost than any unit of its kind. No matter what width spray bar is desired, up to 24 feet, the "Spray Master" just puts the material down like a carpet. With the Vacuum-Flow Full Circulating Spray Bar the individual nozzles can be turned off giving the desired spray bar width for the job. The operator turns the Single Control Valve to Spray and instantly the most efficient spray job is under way. When the end of the job is reached the operator turns the control valve to Circulate and the spray stops instantly. Circulating by Vacuum eliminates any pressure on the spray bar assuring an instant cut off of the spray. Make your next unit a "Spray Master," the Master of Bituminous Material Spraying.

BLACK TOP ROAD MAINTENANCE EQUIPMENT
LB
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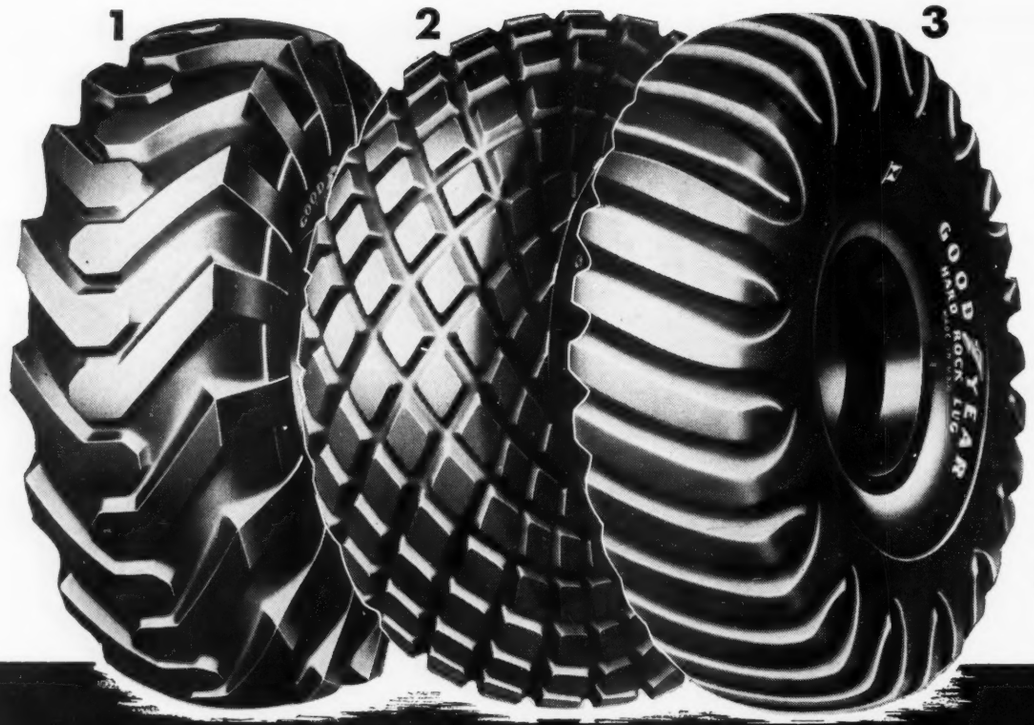
LITTLEFORD

LITTLEFORD BROS., Inc.

465 E. PEARL ST., CINCINNATI 2, OHIO



1

SURE-GRIP EARTH MOVER

—super-traction for drive wheels on all soils (left)

2

ALL-WEATHER EARTH MOVER

—sure-roll for drawn vehicles and for general traction (center)

3

HARD ROCK LUG

—super-armored for all rough and rugged rock work

TOUGH TRIO *that tops em all!*

TAKE the word of men who use them — these three "toughies" are unbeatable for lowest-cost, most efficient off-the-road haulage: The Goodyear Sure-Grip for drive wheels, where hard-working, keep-going traction is needed; the Goodyear All-Weather Earth Mover on drawn vehicles for smooth, easy rolling; the Goodyear Hard Rock Lug for any tough terrain.

The Sure-Grip's self-cleaning, *open center* tread is especially designed to pull through mud and soft soil. Its husky, deep lugs give you power-packed, dependable traction in the stickiest going. The All-Weather Earth Mover with its wide, rounded contours, is made for steady moving with minimum roll resistance. The Hard Rock Lug fights its way in rough and rocky going that cuts other tires to pieces.

These great Goodyear performers provide the most economical work-tire combinations obtainable. Big contractors, who keep accurate records, account them the lowest-cost-per-ton-mile of all off-the-road carriers.

BUY and SPECIFY GOODYEAR
—it pays!

All-Weather, Sure-Grip—T.M.'s The Goodyear Tire & Rubber Company

GOODYEAR

MORE YARDS ARE MOVED ON GOODYEAR OFF-THE-ROAD TIRES THAN ON ANY OTHER KIND

Construction Methods

WALDO G. BOWMAN, Editor

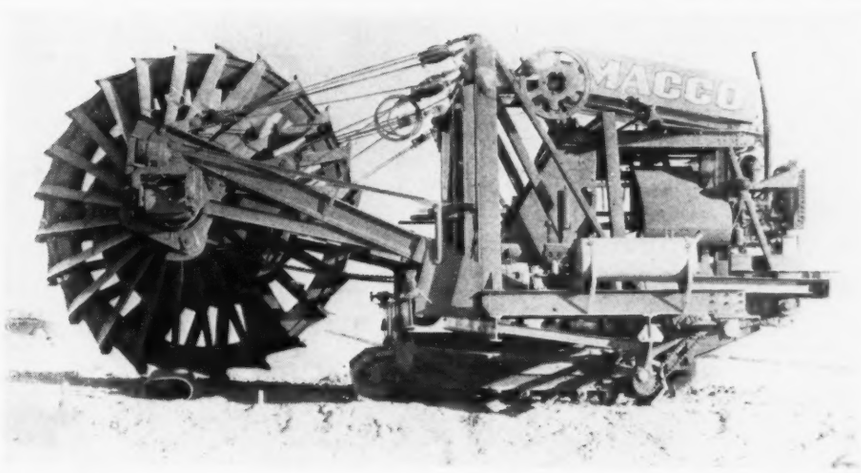
Volume No. 28 | APRIL, 1946 | No. 4

Machine Digs and Trims Canals In One Pass

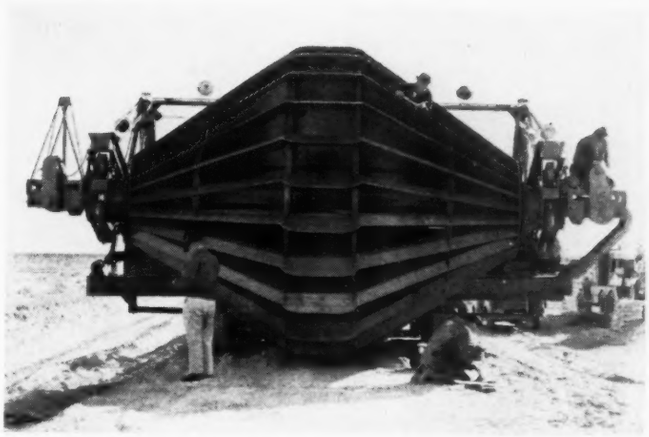
LITTLE BROTHER of the machine Paul Bunyan used in digging the Grand Canyon has been developed by Macco Construction Co., Oakland, Calif., for excavating lateral canals on the Yuma Mesa Division of the Gila Project, right back in Paul's old stamping grounds. Lumbering along under its own power over a previously-compacted embankment, the rig leaves a completely-excavated and neatly-trimmed canal in its wake.

A double conical drum, consisting mostly of cutting edges conforming to the outlines of the canal prism, hangs from an adjustable frame carried on a crawler-mounted bed. Power for propulsion and excavating comes from a big International engine. A gas-driven generator furnishes electric current for electric lights and for motor-operated belts that discharge the spoil to either side from the interior of the drum.

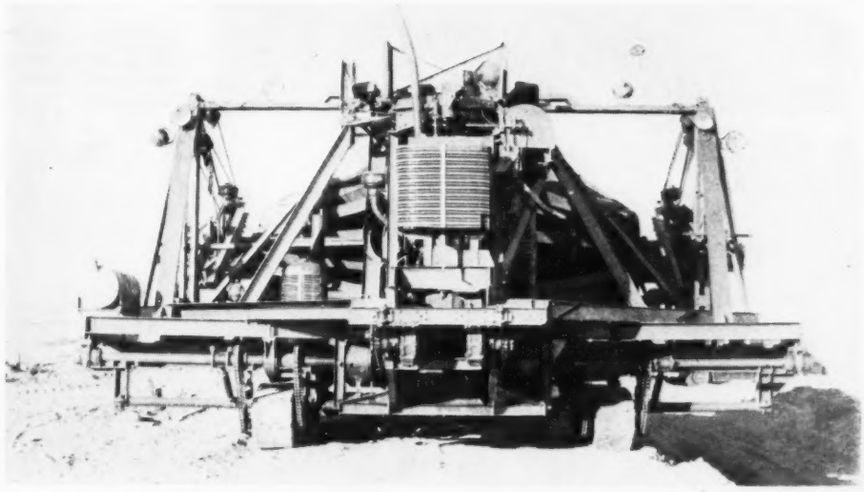
Through the cable-controlled adjustable frame the depth of cut can be varied up to 5 ft., with corresponding variation in top width up to 15 ft. One pass of the rig leaves the bottom and sides of the cut ready for Gunite lining.



SELF - PROPELLED EXCAVATOR cuts and trims small canals in one operation. Side discharge belts lead from center of cutter unit.



HEAD-ON VIEW of cutter drum shows arrangement of blades conforming to shape of canal prism.



MAIN POWER PLANT for propelling rig and revolving cutter is located midships on front end of main frame. Crawlers are independently driven for steering. Small engine at left drives electric generator.

BIG BLAST set off by Army Engineers starts preliminary construction work on Allatoona Dam near Cartersville, Ga. Dam, on Etowah River and estimated to cost $17,400,000, will be concrete gravity structure 1,020 ft. long and 184 ft. high. Preliminary work, mostly clearing, is being done by Army Engineers under direction of John S. Webster, resident engineer. Photo by Jack Copeland

MOERDIJK HIGHWAY BRIDGE across Hollandsche Diep, wrecked by Germans in 1944, is back in service linking northern and southern parts of Holland. Two of intact, curved-top-chord truss spans of nearby railroad bridge were temporarily transferred to highway structure. Each span, weighing 750 tons, was floated off its piers by use of buoyancy tanks, aided by tide, and moved to new position. Two remaining gaps were filled by Callander-Hamilton spans, 165-ft. military trusses used by British army, with temporary intermediate piers built to support them.

THIS MONTH'S NEWS REEL

← CHINESE "SIDEWALK SUPERINTENDENTS" watch heavy equipment of U.S. Marine Corps clear lot in Tientsin to build staff car parking lot. Marine Corps Photo

→ RUSSIAN WOMEN aid in construction of apartment house in Stalingrad. Sovphoto

GROUND IS BROKEN (below) for research center of The B. F. Goodrich Co. at Brecksville, Ohio, with 100-year-old plow which company founder used in his youth. JOHN L. COLLYER, company president, handles plow, while DR. HOWARD E. FRITZ, director of research, drives Cletrac tractor which pulls it.

WORKING 24 HOURS A DAY for 15 days, 100 men with eleven Caterpillar tractors with LeTourneau bulldozers clear 150,000 yd. of earth of Northwestern Pacific R.R. tracks. Slide near San Rafael, Calif., covered track for 550 ft. with blue clay and more than 100 trees.

PLANNING AGENDA for President's Highway Safety Conference, to be held in Washington, D. C., May 8 to 10, are (front row, left to right): ANDREW J. SORDONI, first vice-president, American Automobile Association; BRIG. GEN. EDWARD H. LASTAYO, chief, Highway Division, Office of Chief of Transportation, War Department; THOMAS H. MacDONALD, commissioner of public roads, Federal Works Agency; MAJOR GEN. PHILIP B. FLEMING, federal works administrator; MALCOLM McEACHIN, Nevada secretary of state and president, American Association of Motor Vehicle Administrators; (back row) PYKE JOHNSON, Automotive Safety Foundation; FRED ROFF, president, International Association of Chiefs of Police; COL. L. B. YOST, Transportation Corps, executive director of conference; HERMAN McDONALD, Massachusetts director of public works and president, American Association of State Highway Officials; and NED DEARBORN, president, National Safety Council. Federal Works Agency Photo

CONTRACT FOR DAVIS DAM on Colorado River west of Kingman, Ariz., was awarded to combination of western contractors headed by Utah Construction Co., which submitted low bid of $21,462,505. Here construction engineer H. F. BAHMEIER (left) who will direct work for U.S. Bureau of Reclamation, congratulates T. L. TERRY, construction superintendent for company which also held original contract, terminated due to wartime emergencies in 1943.

HOUSING SHORTAGE at Coulee Dam is relieved by purchase of 50 trailer houses (below) by U.S. Bureau of Reclamation. Trailers will be grouped in Mason addition of project and wired for electric heating and cooking.

NEAT, SIMPLE AND SAFE shoring system of all-steel members braces high bank for Des Moines building job. Whole assembly, except lateral X-bracing, is welded in place. Contacts between arch-web sheeting and wales are welded, backed up with steel shims where necessary to get firm bearing. Raker sets bear against continuous concrete kicker beam over footings.

Welded Steel Bracing Holds High Bank

SHORTAGE OF DIMENSION TIMBER didn't bother Arthur H. Neumann & Bros., Inc., contractors of Des Moines, Iowa, in designing the shoring and bracing system for holding the side of a 33-ft. earth cut on a downtown Des Moines building job. They simply rented some steel beams and angles from a nearby steel fabricating shop and installed a full set of welded steel shores against arch-web sheeting in an assembly that about tops them all for neatness, simplicity and safety. To hold the shoring in place the contractor ingeniously tied a row of pile footing caps into a continuous concrete kicker beam and then strutted across to an adjacent row of caps for additional safety.

The job is a one-story basement and sub-basement extension of the

printing plant of Meredith Publishing Co., along Locust St. in back of the present plant. The extension lies between the Rock Island Railroad tracks and a concrete box sewer at low level on one side, and Locust St. on the other side at high level, about that of the roof of the new addition. At start of work the site was unoccupied, with a natural ground slope running down from the street. Excavation for the job, requiring a 33-ft. cut along the street to foundation level, was complicated by the presence of two 30-in. high-pressure water lines at top of cut beneath the street.

Arch-web Sheeting Driven First

Building plans call for a steel-frame structure, with individual concrete footings under each column founded on clusters of precast concrete piles. The backwall along the street side is 12-in. concrete, designed to hold backfill the full height of cut.

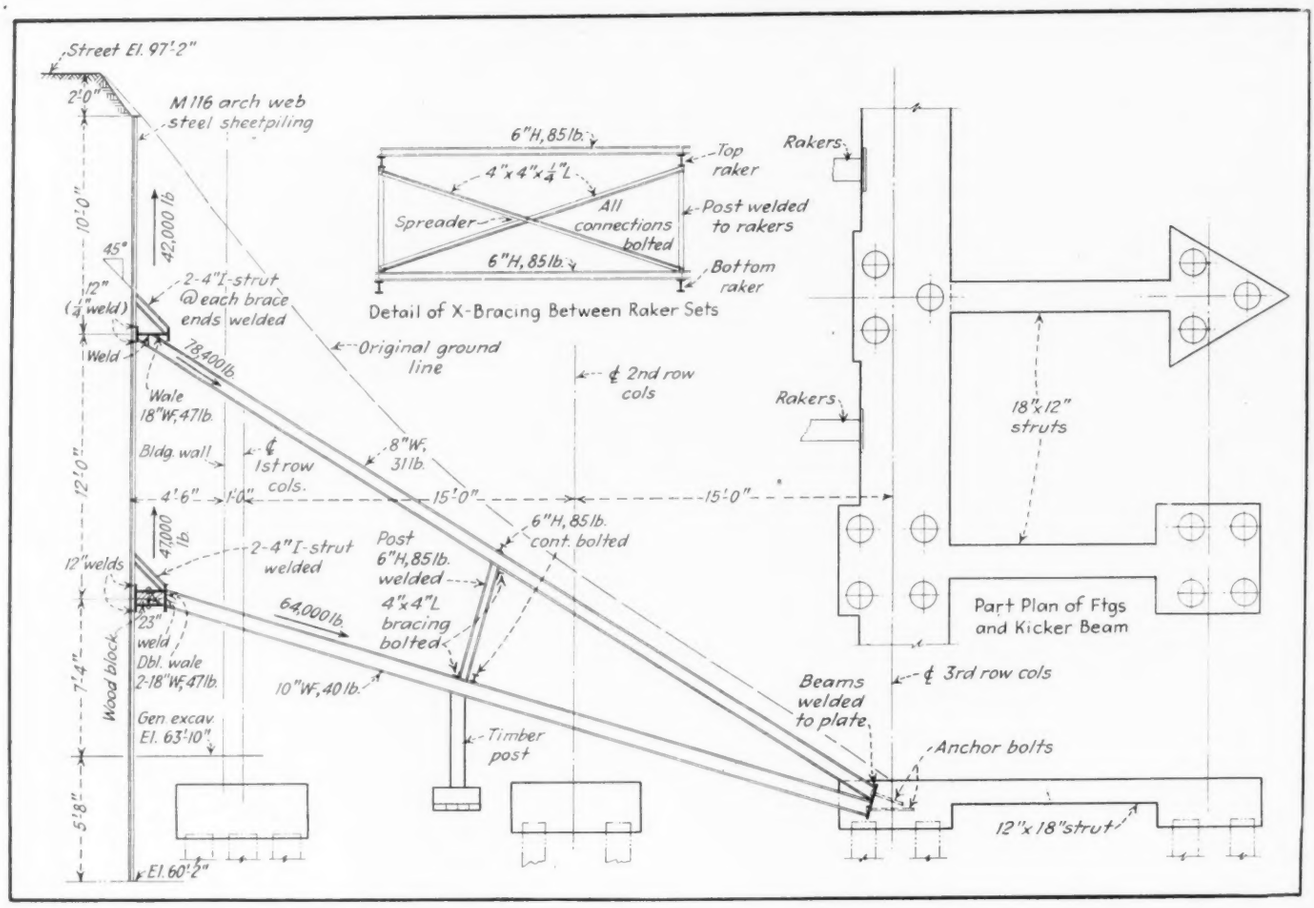
Before disturbing the natural slope, Neumann drove a row of 36-ft. Carnegie M116 arch-web steel sheeting along the street 4½ ft. out from the proposed backwall. Care in driving the sheeting with swinging leads hanging from a Northwest 80 crane resulted in a perfectly-aligned cofferdam wall.

Next, in the toe of the slope about 36 ft. from the sheeting line, footing pits were opened up for the third row of foundations from the backwall, and piles were then driven for these footings. However, instead of pouring separate pile caps, as called for on the plans, the contractor at his own expense joined the footings into a continuous heavily reinforced concrete girder for a kicker beam to hold the steel rakers of the shoring system. In addition to the rod reinforcing, the girder was strengthened by four continuous light railroad rails. Battered recesses to hold base plates for the rakers were formed into the side of the beam midway between pile caps. As an additional precaution to avoid any possibility of the third row of piles, carrying the kicker beam, being shoved over, the piles and caps for the fourth row of columns were next installed, and

CAREFUL DRIVING of Carnegie arch-web 36-ft. sheeting resulted in good alignment of sheeting wall. There are two 30-in. water mains under pavement at left, so contractor took no chances in holding high bank against any possible movement.

→

LATERAL X-BRACING is bolted, all other members of shoring system are welded. Note how ends of rakers are cut for firm bracing against wales. Knee struts from wales to sheeting at each raker set keep wales from kicking up.



DESIGN DETAILS indicate simplicity of shoring system. Footing caps under third row of columns were tied together by contractor as a continuous kicker beam for steel rakers. Space between sheeting and backwall will be backfilled with sand; all steel bracing and sheeting will be recovered.

12x18-in. transverse concrete struts were placed between corresponding pile caps in the two rows.

The contractor designed the shoring system to hold the sheet pile wall in sets of two raker beams in each set, placed from 12 to 14 ft. apart, their lower ends bearing against an inclined plate anchored to the battered recess in the kicker beam. The upper raker is an 8-in. w.f. 31-lb. beam 40½ ft. long, its top end cut to bear against the lower inside flange of a single 18-in. w.f. 47-lb. steel wale set 19 ft. 4 in. above general site excavation level. Framing into a double lower wale, made up of two 18-in. w.f. 47-lb. steel beams and set 7 ft. 4 in. above general lot excavation, is the lower raker in each set, a 10-in. w.f. 49-lb. steel beam 34½ ft. long and cut to bear against outside flanges of the wale.

To prevent possibility of the wales kicking upward, they are welded to the sheeting at raker intersections and in addition, are held by a pair of 4-in. I-beam knee braces extending between the outer flange of the wales and the sheeting at each raker set. All steelwork thus far described is welded in place making an unusually neat installation.

The attention to detail devoted to the job is more strikingly shown, however, by the insertion of steel shims, welded in place, behind the wales at every contact between wale and sheeting. Thus, there is no chance of the sheeting moving out to take bearing against the wales, or of the high bank to start sliding.

Lateral bracing between raker sets consists of panels of 6-in. H-beams crossed-braced by 4-in. angles, all bolted in place. Timber posts shored against the lower raker at cross-bracing panel points add to the stiffness of the sets.

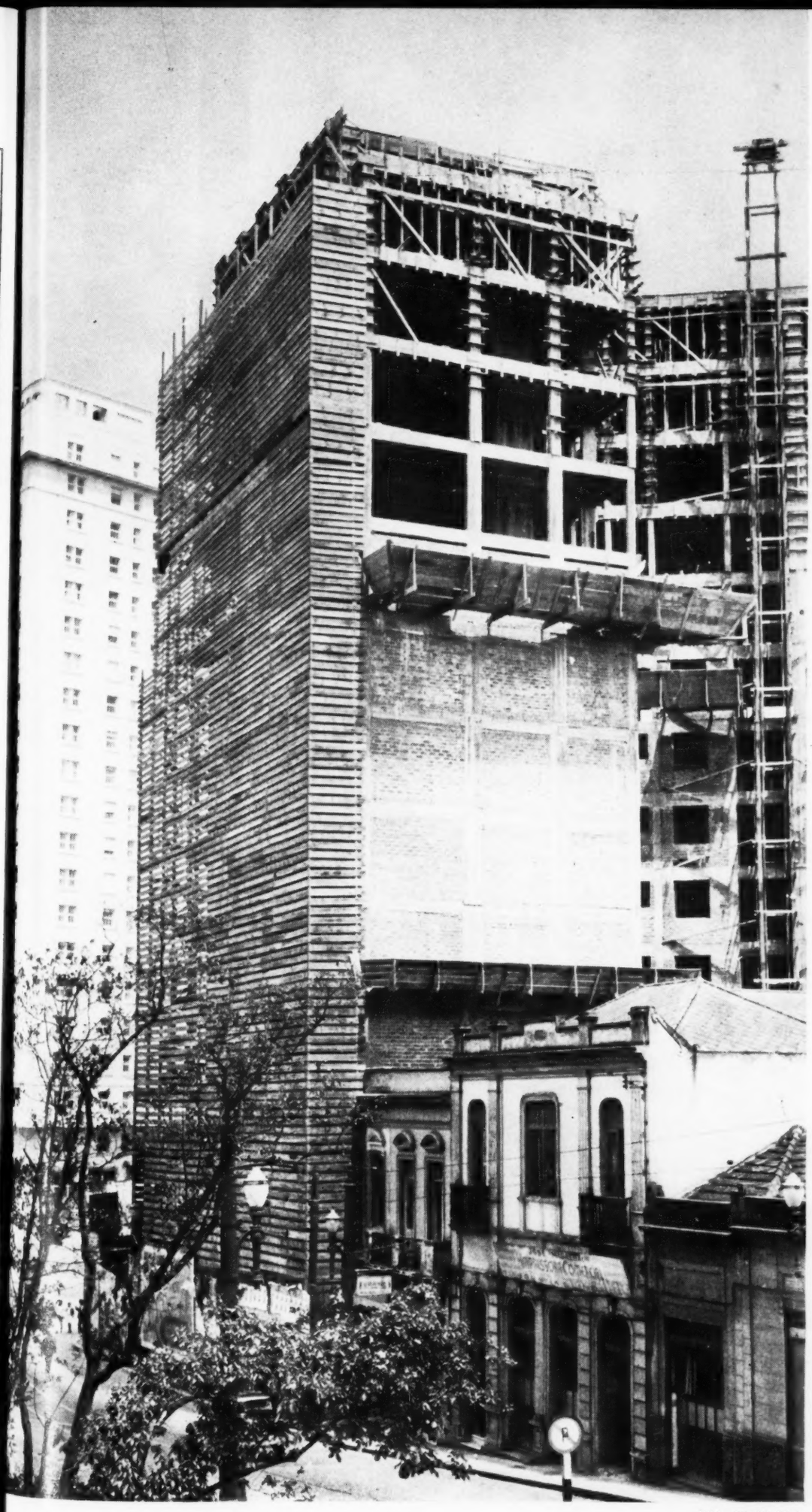
General excavation was started at the junction of the old and new buildings, carried along in stages to permit installation of a few top rakers with their wale, then deepened for the lower rakers and bottom wale. All excavation is by clamshell handled by Northwest crane into dump trucks at street level.

A 110-ft. steam guy derrick set about the middle of the lot erects most of the structural steel. Concrete, dry batched at a central plant, is mixed in a Koehring paver set on the street and handled in buckets, either by crane or derrick.

The 35-ft. precast piles are driven with swinging leads handled by another Northwest crane. A Vulcan No. 1 steam hammer drives the pile, getting steam from the guy derrick hoist boiler.

Upon completion of the steel frame, concrete floors and the concrete backwall, the contractor plans to place struts from wales to backwall at column lines while he removes rakers and backfills between sheeting and wall with sand. Upon completion of backfilling, all shoring and bracing steel will be salvaged.

The building was designed by the architectural firms of Holabird & Root, Chicago, and Brooks & Borg, Des Moines. W. H. Miller is superintendent on the job for Neumann.

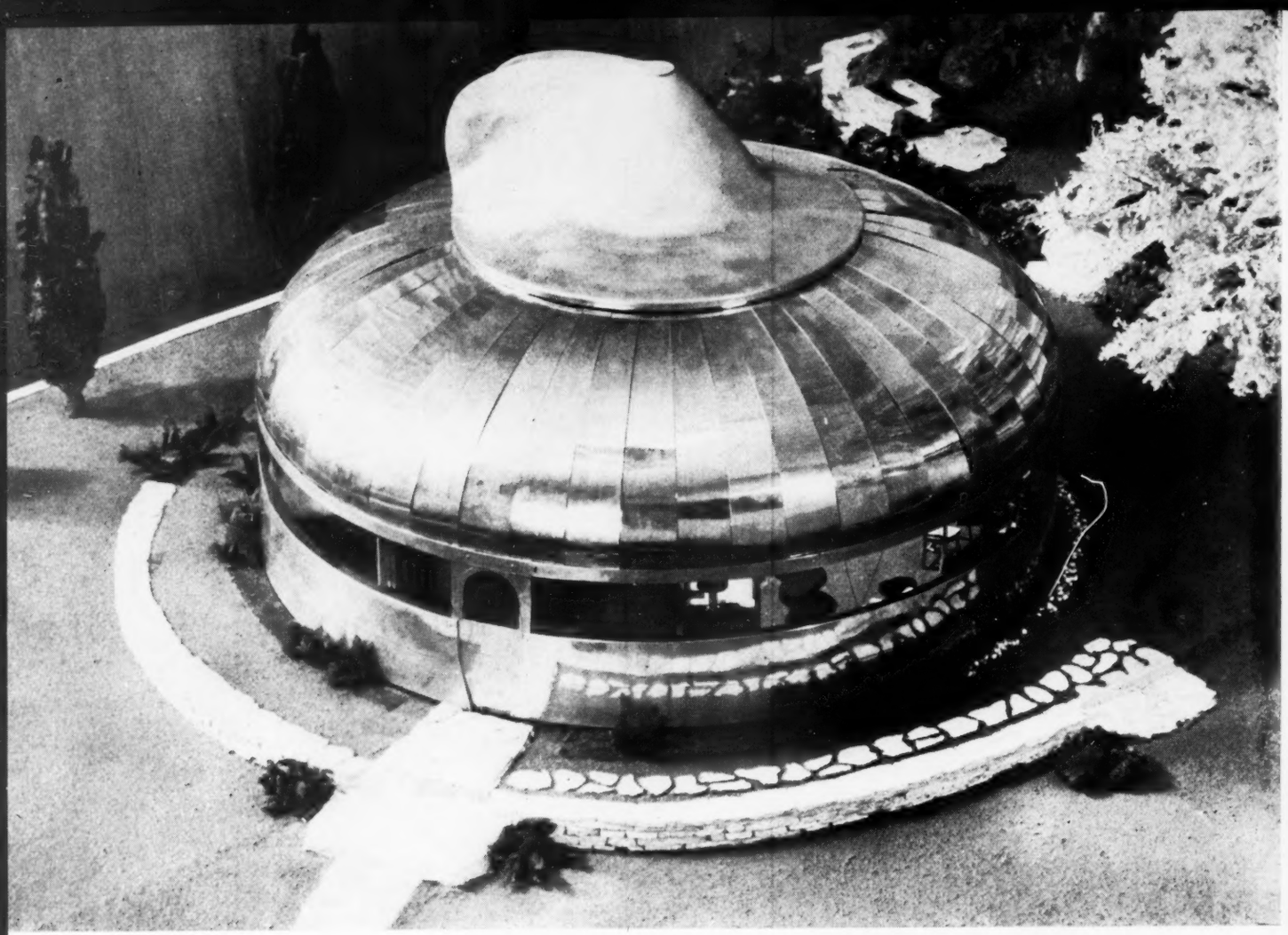


Wide World Photo

Building Inclosure Protects Public

Chances of passers-by getting conked on the head by falling objects from high building construction are nil in Sao Paulo, Brazil, where the building code requires temporary inclosures of walls on street exposures. This view shows a typical inclosing scaffold on a 13-story concrete apartment house under construction on Sao Paulo's Rua Qurno de Andrade. Catch-all scaffolds also have been cantilevered out from the building as a protection to low adjacent buildings.

SAFETY ON THE JOB



HEMISPHERICAL IN SHAPE, Fuller house is made of lightweight metals and plastics. It is 36 ft. in diameter and 22 ft. high and weighs 4 tons. Ventilator of 18-ft. diameter rotates on roof, changing direction with the wind. Photos by Victor Keppler

CIRCULAR ALUMINUM HOUSES DESIGNED FOR MASS PRODUCTION

MASS PRODUCTION of 50,000 completely equipped homes in 1947 is planned by Fuller Houses, Inc., at the Wichita, Kan., plant of Beech Aircraft Corp. Constructed of lightweight aluminum alloy, stainless steel, Plexiglas and other plastics, the hemisphere-shaped Fuller house incloses 1,017 sq. ft. of floor space and weighs only 8,000 lb. It can be shipped anywhere in the United

← LIVING ROOM, shown in scale model with roof and ceiling removed, incloses 337 sq. ft. Inside doors close and open like accordion. Aluminum partitions are decorated with panels of aircraft plywood. Fanshaped floor is of plywood grooved into aluminum strips.

States and erected for a total cost of $6,500. The outside diameter is 36 ft.

Designed by R. Buckminster Fuller, chairman of the board and chief engineer for the newly-formed company, the entire house is suspended from a central mast of stainless steel. The skeleton structure consists of a compression-tension cage of metal members over which is stretched a skin of aluminum alloy. This cage features the use of three compression rings made of steel tubing—the smallest located at the top of the mast, a second larger ring half way down the roof and the third and largest forming the perimeter at the base of the roof. The top ring is attached to the mast by criss-crossed tension rods. The same type of triangulated construction connects the remaining compression rings, holds up the floor and extends to the ground anchoring.

PICTURE WINDOW of Plexiglas encircles living room. When air conditioning is not in use, entire section of wall under windows can be lowered by pull cord, exposing washable plastic screen that lets in fresh air.

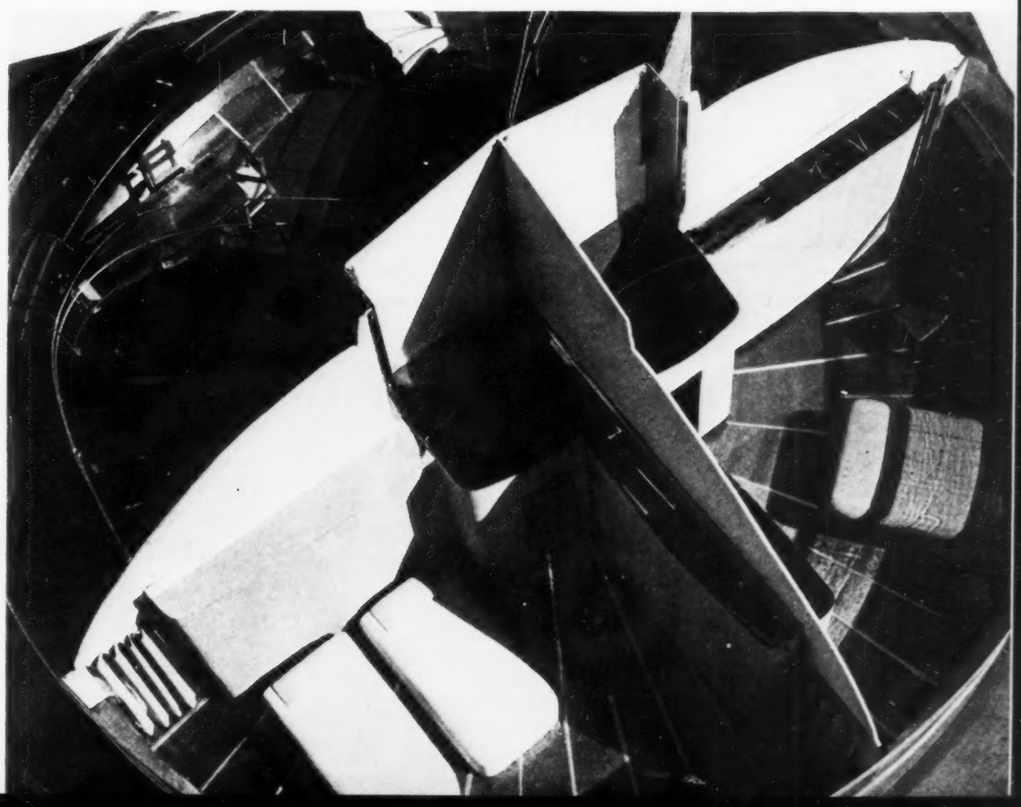
DESIGNER of Fuller house is **R. BUCKMINSTER FULLER**, chairman of board and chief engineer for Fuller Houses, Inc.

The total compression element in the house has been combined in the central mast which provides an overall height of 22 ft. and a floor to ceiling height of 16 ft. The roof, wall and floor are suspended from secondary web spreaders at the top of the mast. The house is said to articulate; that is, the various structural components are joined in a mechanical system so that when pressure is applied at any one point the resulting strain is distributed throughout the entire structure. This light assembly, in which the walls have no weight-supporting function, results in a structure weighing only ½ lb. per cu. ft. The mast, constructed of seven hollow stainless steel tubes, will support a weight of 125,000 lb.

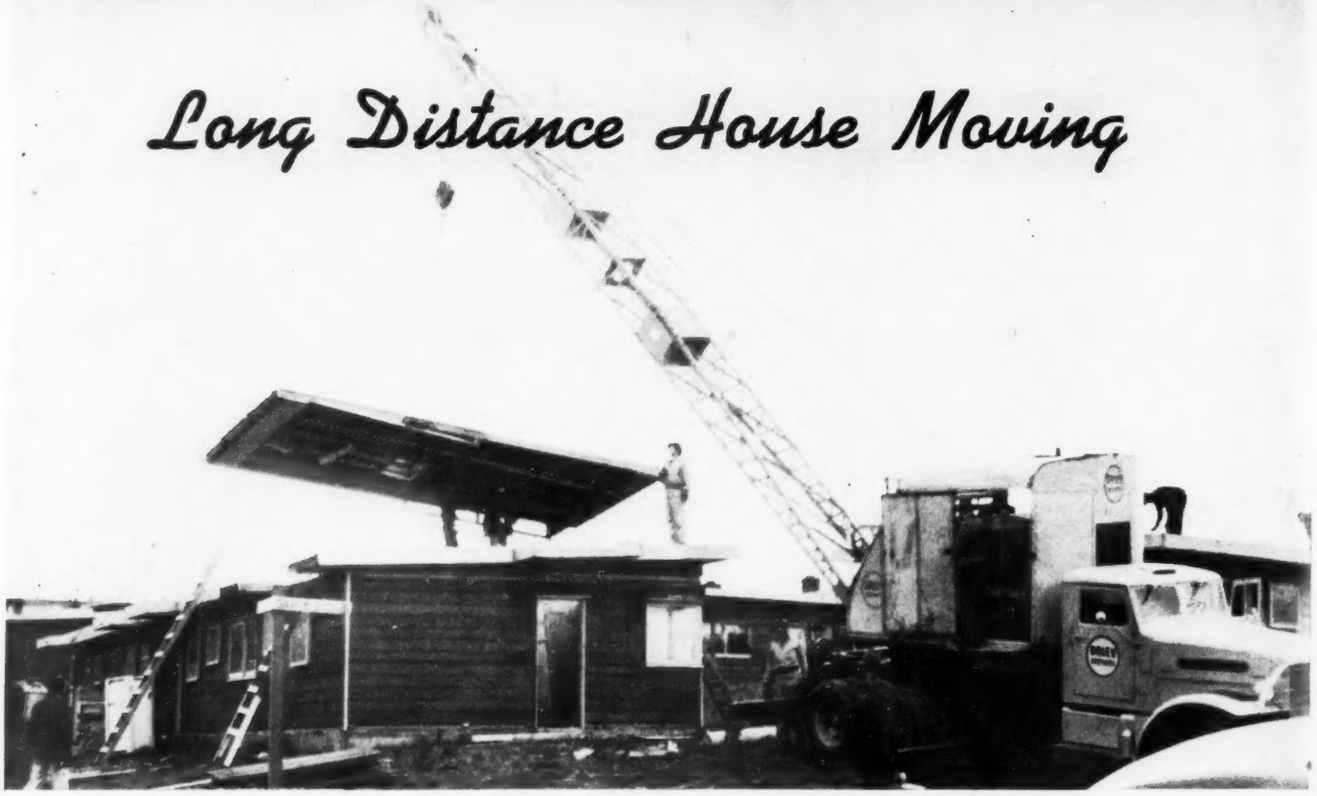
The design of the house is based on the "Dymaxion" dwelling which Mr. Fuller developed in 1927. It features two bedrooms, two baths, living room, foyer and a completely equipped kitchen, including such facilities as an automatic dishwasher, deep-freeze unit and garbage disposal unit, as well as a

(Continued on page 164)

TWO BEDROOMS (below) each have area of 215 sq. ft., with bathrooms adjoining. All service facilities are grouped in and around central column.



Long Distance House Moving



NOT SO TEMPORARY as originally planned, low-cost housing units are dismantled in panels by truck crane for truck transportation from East Port Orchard, Wash., to Los Angeles, where they will help relieve southern California housing shortage. Acme Photo

DISMANTLING AND SHIPPING temporary housing units from Puget Sound to Los Angeles and from Georgia to New York City indicates that the shortage in living quarters knows no geographical boundaries. These moving jobs also portray the critical situation in lumber and other building products, for tearing down, shipping the width of the country, and re-erecting temporary-type houses is not the most economical solution to the housing problem.

At East Port Orchard, Wash., near the Puget Sound Navy Yard, a group of panel-fabricated multiple-family units is being dismantled, loaded on to trucks and moved to Los Angeles, where they will be reassembled on the job. Daley Bros., San Francisco contractors, are doing the work.

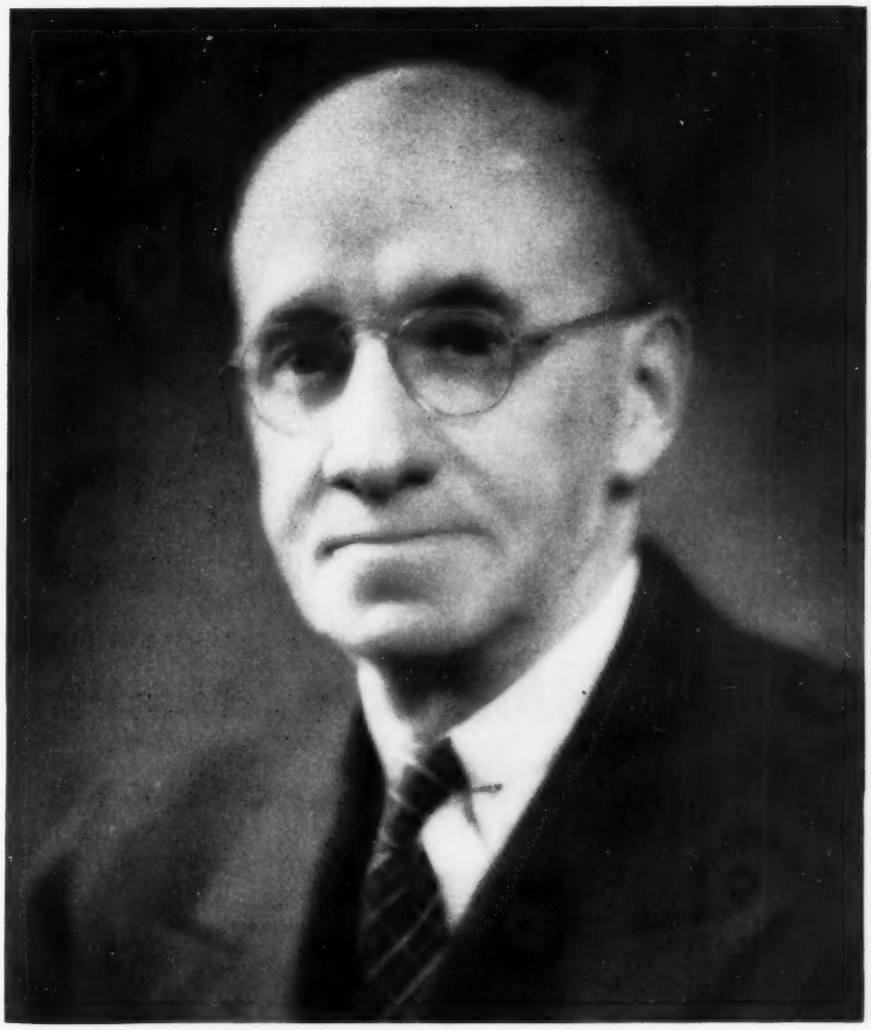
Georgia Houses to New York—A total of 976 family quarters in 6 and 8-apartment units is being cut into shipping sizes at Brunswick, Ga., for rail transportation to New York City, where they are rebuilt as emergency shelter units at Canarsie Beach Park. These houses were originally built up of prefabricated wallboard on wood panel walls, continuous wood flooring and part-continuous roof sheeting covered with asphalt shingles. In dismantling operations, the apartments are cut up into 6 x 12-ft. panels for easy shipment. Windows and doors are left in place, with little resulting damage.

The buildings are re-erected on creosoted mud sill and post foundations. Because of northern weather conditions, the original wallboard exterior walls are sheeted with tar paper and then covered with clapboard siding. Aluminum foil insulation is added to the floors and batt insulation, used at the original site against heat, is being replaced.

Preparation of the new site, including installation of streets and utilities, is being done by Del Balso Construction Corp. for the New York City Housing Authority under the engineering direction of W. C. Vladeck. The Federal Public Housing Authority, under the supervision of Stanley W. Moore, is doing the dismantling, transportation and re-erection of the units by fixed-fee contracts. General Fabricating Const. Co., New York, holds contracts for the dismantling and rebuilding work.

DISMANTLING GEORGIA HOUSES (below) for shipment to New York City involves cutting multiple-family units up into small panel sections for transporting by rail. Windows and doors are barred and left in place, with little damage in shipping.

Cited for Service



ROY A. MAC GREGOR

WAY BACK IN 1936 a remark by one of his Board of Governors: "Tell em, Mac, the Workmen's Compensation Insurance Rates are too damned high," got Roy A. MacGregor, executive secretary of the Constructors Association of Western Pennsylvania, interested in construction safety. Upon investigation Mac soon found out why compensation rates were high—simply too many construction accidents. Being a two-fisted Scotchman and lacking none of the pecuniary traits of his race, Mac didn't sit around and moan about the high rates—he set out to do something about them. With the encouragement and cooperation of his association, he organized a continuing construction safety program that has consistently paid dividends in lower net premium rates for his members and in a gratifying reduction in the number of accidents.

Mac has pounded away on the program year in and year out. He conducts safety meetings, especially those for foremen and supervisors, he sponsors contests, he organizes training programs and outlines means for making every person on the job safety conscious.

In the needed field of public relations for contractors, MacGregor has carried the pilot light. Over the radio, through the press and from the speakers' platform Mac has exhorted the virtues of contractors and the contracting system.

Another star in the Association's affairs is its Labor Relations. Mac was catapulted into labor activities, he avers, "when a suave gentleman dropped in to say he had come to Pittsburgh to organize heavy and highway contractor labor for the A. F. of L." Out of subsequent negotiations came a model agreement that differentiates between building trades and other work, an agreement that has been renewed year after year with only slight changes and very little trouble.

In checking into his personal history we find Mac was born on the Connecticut side of the tract now desired by UNO for its permanent home, but he doubts if that has any bearing on the UNO choice of location. In the course of events he landed in Pittsburgh in 1918 selling construction equipment as district manager for the Lakewood Engineering Co. His ensuing acquaintanceship with contractors resulted in a draft call as executive secretary of the Constructors Association of Western Pennsylvania, now affiliated with AGC, when it was founded in 1934.

There is no estimate of the number of construction workers alive and well today that might have been accidentally killed or injured if Mac hadn't become interested in construction safety, or the number of jobs his public relations work has brought to his members, or the number of disputes his labor agreement has prevented. But there is no doubt that contracting in western Pennsylvania has been benefited by the untiring efforts of this little Scotchman.

GOOD MANAGEMENT BEST BASIS FOR FINANCING EQUIPMENT PURCHASES

By **G. M. JUST** Credit Manager, International Harvester Co., Chicago.

These notes were abstracted from a paper delivered by Mr. Just at the 27th annual meeting of the Associated Equipment Distributors in Chicago, Jan. 27-31, 1946.

MUTUAL CONFIDENCE and cooperation are two factors in developing equipment credit relations on a friendly, constructive and profitable plane. Credit management cannot function on the basis of "yes" or "no."

Years ago one of our officials summed up the thought: "You can sell anyone on some basis even though it may have to be for cash, but, if it must be for cash, do it in such a manner that the customer likes and respects you for selling him on that basis." This expression can be translated to cover many other situations than a difficult customer sale. The credit manager should, and generally does, know how to analyze constructively a customer's method of operation.

Sound Basis for Credit

Evidence of good capable management will go a long way toward establishing confidence on the part of a credit manager in a customer. Good management embodies genuine ability and resourcefulness which are not merely in evidence on a day-to-day basis, but which also provide able planning considerably into the future. Advance planning should, by all means, include establishing, before serious need arises, a convenient and acceptable source for financing installment sales.

Before long, contractors and other purchasers of equipment will again require some financing. Many will borrow from their banks and pay cash for what they buy, but others will expect the distributor to make the arrangements for them. Hundreds of banks throughout the country are eager to handle good sound conditional sales contracts or installment notes and are a logical place for such financing. The banks have the resources to invest in this manner.

There are also several well-known finance companies which solicit equipment financing. If their plans are right both for the distributor and for the customer, they are additional sources for financing. Whether a distributor prefers a bank or a finance company, the stock in trade of these institutions is money; their business is financing not manufacturing, and they should be able to serve a firm's total financing requirements satisfactorily for all concerned. Arrangements can be made with one of these lending institutions with greater convenience than would be possible through several different manufacturers.

In many businesses it is the general practice to take an inventory and determine the results—draw off a profit and loss statement—at the end of the fiscal year. The equip-

ment business is so fast and complex that many things can happen to change the entire picture within a short time, and the annual method of "counting the chips" is entirely outmoded and inadequate. Distributors in general, but with numerous exceptions, employ experienced accountants and endeavor to keep fairly comprehensive records. From such records, it is possible to determine day by day, or at least once each month, the exact trend of the business and the operating results in each department.

Good comprehensive records are indispensable. Thorough accounting procedures and detailed operating statements make it possible to keep credit managers of principal suppliers acquainted with the financial standing and progress of the business. This principle applies both to distributors and to contractors.

Trade-ins have not been a problem for the last few years, when every used machine could be sold at the ceiling price and at a profit. Every dealer and every user of construction equipment knows what will happen to ceiling prices on second-hand equipment as soon as new machines become more plentiful.

Before the war, there were two ceiling prices on used equipment, the customer's and the distributor's. For the customer, the ceiling price for the machine he wanted to trade in was the top price he could get someone to bid for it. There were many times when the bidding for the used machine was more spirited than the effort which went into selling the new machine.

For the distributor, the ceiling price has to be figured on a different basis. To him the ceiling is what the machine is actually worth what he can sell it for to another customer. Promptness in reconditioning trade-in machines and getting them resold quickly to the best possible advantage has always been important, but it is going to be more important than ever during the next year or two.

Distributors must be prepared for a rapid decline in value of used equipment in relation to recent high price levels. It will be costly to get caught with an inventory of used equipment at any time during the period while this price adjustment reaction is taking place.

A refresher course in the extension of installment credit is in order before a distributor is called upon to do a volume of time business. Lessons of the past can be extremely helpful if they are not forgotten. A few stiff jolts from bad credits or from repossessed machines which may have been misused on an unprofitable contract will cause alarming changes in the bank account.

By and large, equipment distributors are more firmly established than ever before. They have achieved this condition despite shortages of machines and innumerable other problems brought on by wartime conditions. The achievement took real ingenuity and good management. Sales prospects for the next few years are extremely promising. The same kind of management will bring about tremendous growth in the construction equipment industry.

TERM FINANCING FOR EQUIPMENT PURCHASES CONSERVES CONTRACTOR'S WORKING CAPITAL

By E. T. NEVILLE
Vice-President, National Sales Director
C.I.T. Corporation, New York

In the previous article Mr. Just mentions finance companies as a source of credit for equipment purchases. Mr. Neville, an officer of one of the larger finance companies, explains in the following article the many advantages of conserving the contractor's working capital by using the term-financing method in paying for equipment. He also points out how the plan applies to dealers and distributors as well as to contractors.

FINANCING ON REASONABLE TERMS of large-scale purchases of machinery is a fundamental prerequisite for a period of high construction activity and employment.

Contractors have a choice of several methods of financing such purchases. For many concerns, the use of term financing, arranged through

a sales finance company, possesses a number of advantages and avoids several disadvantages which attach in many instances to the use of alternative financing methods.

It is imperative that a contractor maintain a strong working capital position as the construction industry swings into the confidently-expected period of expanding volume. In undertaking each new contract for which equipment purchases may be required, a contractor ordinarily must be prepared to face several months during which outgo will exceed income.

In buying equipment, the contractor who does not want to use his liquid resources for this purpose might seek a bank loan. He might even try to borrow the money from a government lending agency. Another widely used method is to make financing arrangements with a sales finance company for the purchase of installment notes to spread payments for the machinery over a period of time, enabling him to meet maturities partially or substantially out of depreciation deductions. This article deals, primarily, with this last method, and outlines the procedure followed by concerns who have applied it successfully.

Sales Finance Companies

Contractors, and also distributors, can finance equipment purchases through sales finance companies. This plan provides for a cash down payment, with installments or term payments for the balance of the purchase price spread over periods up to 18 months or two years for most classes of heavy construction machinery. In this way, the earnings derived from the equipment automatically provide funds for the payment of the installment notes as they become due.

Term financing offers additional advantages to contractor's buying equipment. His bank credit position is improved, because the purchase of income-producing equipment strengthens his earning power, and thus the banks are more ready to lend short-term funds to meet payrolls, to carry short-term receivables and to purchase materials.

Machinery purchases under the term financing plan are arranged by sales finance companies in two ways: (1) the contractor can apply directly to the sales finance company for terms; or (2) the purchaser can request that the distributor who sells him the equipment make the requisite arrangements for payment on the installment plan.

Some distributors may not be fully acquainted with installment sales procedure as offered by sales finance companies. If a contractor finds that the distributor is not familiar with such arrangements, he can either recommend that the distributor investigate the possibilities or apply himself to a sales finance company for information. If the contractor makes an arrangement directly with the finance company, he then pays cash in full for the equipment.

Term financing of equipment is a well-established practice today in construction as well as in many other industries, such as textile and printing, where large quantities of machinery are sold on an installment basis. In fact, wherever standardized machinery is sold this type of financing can be applied on a mass basis.

Sales finance companies, with experience in financing millions of dollars worth of equipment, have found that their credit experience is good and their loss ratio small. As a result, the rates charged do not include a substantial loss reserve, and compare favorably with other sources of funds.

Equipment Financing Plan

A construction equipment financing plan sponsored by the writer's own company is an example of arrangements offered by sales finance companies. This plan provides funds for buying machinery on an installment basis without sacrificing any benefits which might accrue through a cash transaction. Repayment is arranged over such periods of time as are best suited to the needs of the business.

Several purchases may be financed simultaneously even though they be made from different suppliers. This method of consolidating several items into one obligation is the result of years of our own experience in machinery financing. Through its use buyers can conserve time and bookkeeping as well as operating capital.

When purchasing one or more items of equipment, the procedure to be followed by a contractor is simple. Before the equipment purchased is ready for delivery, the buyer notifies a finance company representative that he is buying certain types of machinery, the agreed price and terms are stated.

If the buyer has not previously done business with the particular company he applies to, sufficient general information is required to enable the lender to render a prompt credit decision. Upon approval of the transaction and completion of a few necessary documents, all that remains is word from the seller that the equipment is ready for delivery. A finance company check concludes the deal.

Examples in Contracting

Any sound construction firm can readily obtain working capital in small or large accounts through this method. The following actual cases from our own records will illustrate how the plan operates.

The X.Y.Z. Construction Co. was succesful bidder on a large job requiring an additional equipment investment of more than a million dollars. Although this firm was well financed, it decided, as a sound business move, to borrow the money and let the equipment pay for itself while in use. The loan could be amortized over many months, and the firm's working capital would be left unimpaired for payrolls, supplies and general operating expenses.

In arranging the loan details, the contractor submitted a financial statement and a list of equipment wanted, together with costs, names of dealers, delivery dates and all pertinent facts regarding the contract, such as completion dates and schedules for use of the new equipment. The various plant items were to be purchased from several distributors, and an arrangement was worked out whereby the total amount involved was combined in one obligation.

As each piece of equipment was made ready for delivery, the finance company provided the necessary funds. Interest was calculated from the date of each payment, the only charge made, and was to continue as long as the borrower had the use of the money. A series of monthly payments was arranged which automatically retired the obligation without the necessity of the contractor "earmarking" large amounts of working funds against topheavy maturity dates at frequent intervals. The arrangement made

it possible for this concern to obtain every item of equipment needed without tying up its working capital otherwise required to carry on the project.

The plan works just as smoothly where smaller amounts are involved. Take the case of another contractor, let's call them the A.B.C. Co., who wanted to buy a combination shovel-crane-dragline costing $20,000.

This company was prepared to make a down-payment of $5,000 and asked us to finance the balance of $15,000 over a period of 18 months. The contractor furnished the required financial information regarding his business and submitted trade references. Also furnished was a description of the equipment, and the name of the distributor, together with a statement of purchase price, desired down payment, and terms for the balance, and the delivery date.

Upon receipt of this information, we rendered a prompt credit approval and the only remaining details were the signing of necessary papers, followed by our check to close the purchase as quickly as delivery could be made. This case history closely parallels the larger transaction previously described involving a million dollars, and is cited to illustrate the ease with which small purchases can be financed as well as those calling for large amounts.

When emergencies make it difficult for a concern to meet, rigidly, the amortization terms set forth in its financial contract, adjustments can be made to suit existing conditions, depending upon the merits of each individual situation. For example, in some areas it is only possible for a contractor to work during certain months each year due to weather conditions. In such cases, schedules of payments are worked out so that monthly installments are smaller during the inactive periods. The procedure in arranging equipment financing is virtually the same in all cases, and credit decisions are based upon the record and financial standing of the applicant, without regard to the amount involved.

Financing for Distributors

Installment financing is equally advantageous to distributors under a special construction equipment plan that includes wholesale accommodations and retail sales financing. It enables distributors to handle a larger volume of sales on their capital investment with less risk of losses due to bad credit.

One big advantage of this plan is to turn time payment transactions into cash sales without interfering with credit terms or sales policy. Working capital is conserved and, in addition, a continual fund of ready cash is created as rapidly as equipment is sold.

To illustrate how this construction equipment finance plan operates, let's take an actual case of a distributor company which has served an established list of contractors for many years.

John Doe, a dealer, has been looking ahead to the day when the manufacturers he represents can again fully supply his equipment needs. Inquiries and orders from contractors have been pouring in and, to handle the volume of business in sight, the Doe Equipment Co. realizes that it will have to carry a comprehensive line of machinery and supplies.

This distributor's problem is, largely, how to finance an increasing volume of both purchases and sales on his present invested capital. He needs wholesale accommodations, as well as means of turning installment sales into cash for operating purposes, thereby being able to handle more equipment without increasing his capitalization.

To meet this situation, a term financing arrangement has been worked out whereby the company's stock purchases of new equipment will be financed on a quarterly basis, subject to partial renewals if necessary. Included in this wholesale plan is a rental agreement to permit the company to put any of its idle equipment to work on a daily, weekly or monthly rental basis. These two arrangements permit the distributor to carry a much larger assortment of equipment than would otherwise be possible. The distributor's working capital is left free for operating purposes, and the company is in a much better position to serve the needs of its customers by having on hand adequate stocks for selection and prompt delivery.

A further step in this distributor's marketing plans is the financing of installment sales. In the past, the largest part of the company's business was done on credit, which meant the tying up of substantial amounts for long periods, and also involved the expense of credit checking and collecting, together with the risk of loss due to bad accounts.

To overcome these drawbacks John Doe decided to handle all of his company's installment paper by term financing. It was agreed

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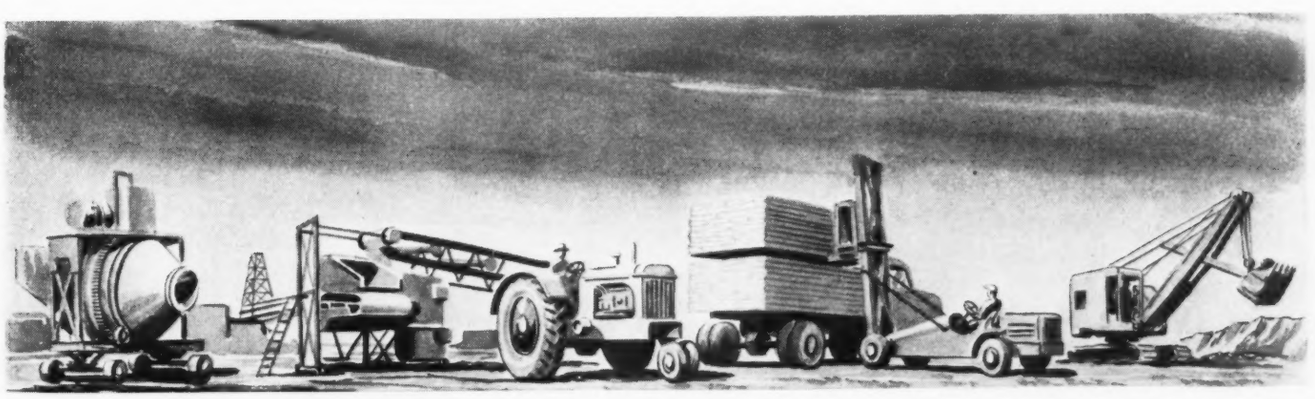
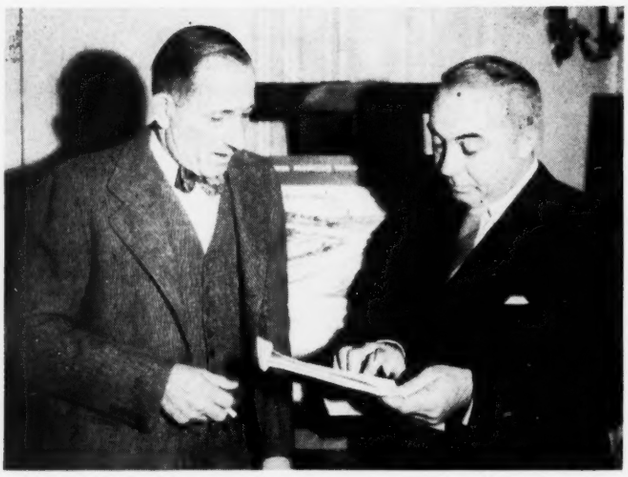
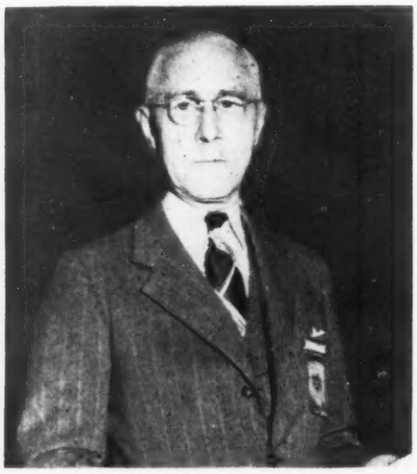


Seen and Heard at the Associate

BIG FOUR of the A.G.C.: The big Texan and new president, WARREN S. BELLOWS of Houston, incoming vice-president FORREST W. PARROTT, C. F. Lytle Co., Sioux City, Ia.; outgoing president HARRY DICK, Gilpin Const. Co., Portland, Ore., bowed down by a year's strenuous duty; and hardworking H. E. (Doc) FOREMAN, managing director.



MORRIS DE WITT (left), Poplar Bluff, Mo., highway builder, takes over the chairmanship of the Highway Contractors Division from DWIGHT WINKLEMAN, Syracuse, N. Y. J. R. Wininger, Portland, Ore., named vice-chairman, was unable to attend the convention.



E. C. L. (Honus) WAGNER, manager of the Associated General Contractors of Missouri, is the proud recipient of the "Constructiondizing" award for outstanding work in promoting construction in his home state.

LIEUT. GEN. RAYMOND A. WHEELER, genial Chief of Engineers, headed the list of distinguished guests and told the contractors about the prospects in flood control and river and harbor work.

CONSTRUCTION PROSPECTS FOR 1946—not bad, at that—were outlined by JOHN L. HAYNES, chief, Construction Div., U. S. Dept. of Commerce.

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LABOR ACTIVITIES get a big play at the meeting with these three (below) in leading roles: W. J. BARNEY, New York City, chairman of the Apprenticeship Committee; JIM MARSHALL, A.G.C. assistant managing director in charge of labor relations; and EDWARD P. PALMER, New York City, chairman of the Labor Committee.

JAMES R. EDMUNDS, JR., Baltimore, Md. (below), president of the American Institute of Architects, discusses building problems with FORD J. TWAITS, veteran Los Angeles builder and retiring chairman of the A.G.C. Building Contractors Division.

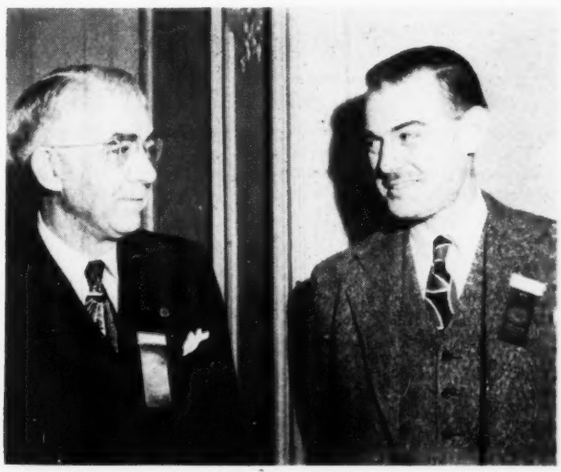
BELIEVE IT OR NOT, a lady contractor, MRS. JEANETTE DALEY (below), president of Daley-Tulloch Corp., Phoenix, Ariz., builds highways in Arizona and California and runs a couple of commercial sand and rock plants on the side.

General Contractors Convention

BUILDING CONTRACTORS DIVISION will be under the direction of WALTER K. SHAW (left), New York City, and WALTER R. COUSE, Detroit, named chairman and vice-chairman, respectively.

GLEN W. MAXON (center), Dayton, Ohio, heaves a sigh of relief as he hands over the direction of the Heavy and Railroad Contractors Division to CARL JANSEN (left), new chairman from Pittsburgh, and GEO. ATKINSON, vice-chairman, San Francisco.

REPRESENTING THE A.A.S.H.O. in joint committee meeting with the A.G.C. were M. J. (Mike) HOFFMAN, president of the highway officials and Commissioner of Highways in Minnesota, and A. C. CLARK, chief of the construction bureau, Public Roads Administration.



HARRY DICK, retiring president of the A.G.C. gets smiling assurance from CAROL WINCHESTER, secretary of Associated Equipment Distributors, that some day there will be plenty of equipment available.

LONE LADY among the A.G.C. chapter secretaries and managers is vivacious RUTH ANN LESLIE—sorry, boys, it's Mrs.—secretary of the Oklahoma Builders Chapter, Oklahoma City

REAR ADMIRAL HENRY G. TAYLOR (CEC) (below), superintending civil engineer for Navy Area V, who pinch-hitted for Rear Admiral J. J. Manning, chats with OSCAR B. COBLENTZ of Baltimore, Md.

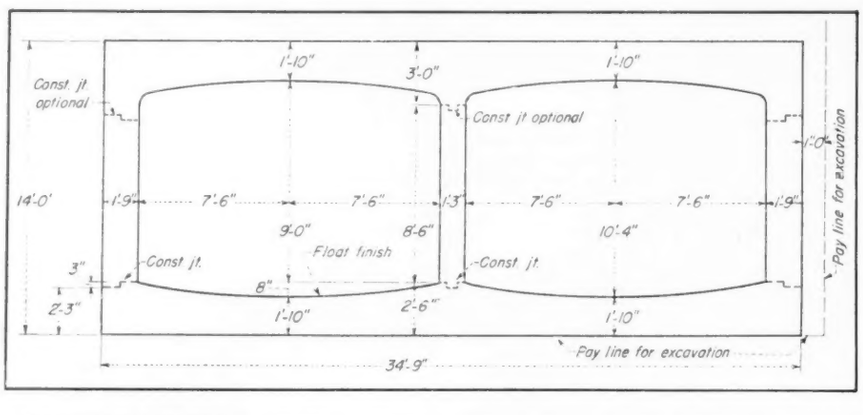
LOOKS AS IF G. K. VIALL (center, below), vice-president of the Chain Belt Co., Milwaukee and a convention speaker, has just closed a deal with PAT ZACHRY (left), San Antonio, Tex., while STEVE BECHTEL, of San Francisco, looks skeptical about the whole works.

Caging a Creek with Traveling Forms

BOXING UP Coldwater Creek in a 4,800-ft. double culvert through an extension of Lambert-St. Louis municipal airport is a hit-and-run proposition. Fred Weber, Jr., St. Louis contractor on the job, has learned when to hit and when to run. The box drain follows and fills the present creek channel, leaving no room for bypassing the stream flow. Therefore, when the creek is low and docile, Weber hits the job hard with a neat traveling steel form layout. But when the creek wants the channel for its exclusive use and goes on a rampage, which it often does, Weber yanks his travelers and everything else loose out of the waterway and runs.

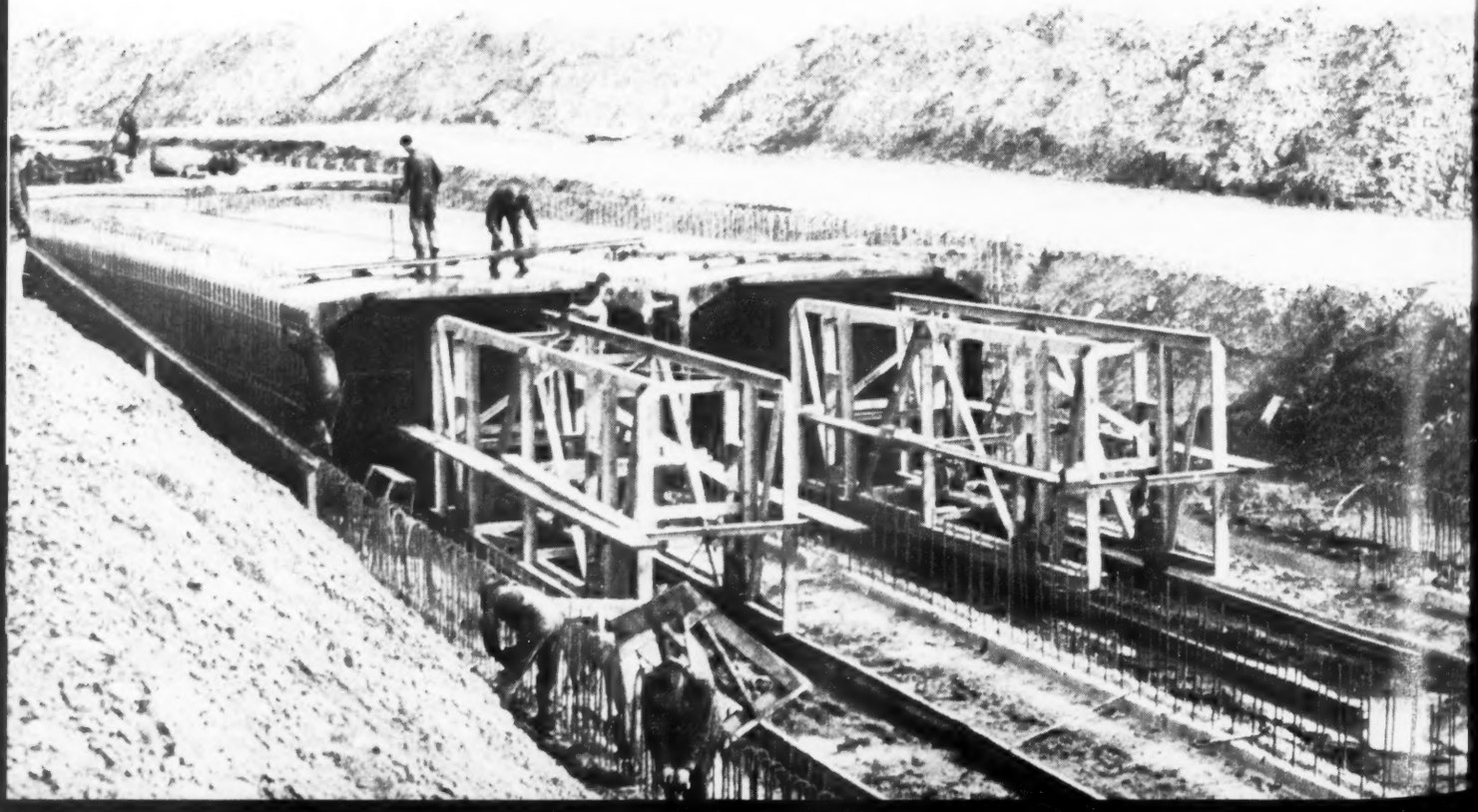
Coldwater Creek drains most of northwest St. Louis County. It skirts the south and east sides of the present airport, and meanders right through a proposed extension of the field to the east. Relocation of the stream is impracticable, especially as it already serves as the outlet for all underground drains in the landing field, so it is being caged in a double concrete box culvert that must support long stretches of new runways.

Because of the tremendous superimposed loading by big planes, the culvert is unusually heavy in design. Throughout its 4,800 ft. in length it consists of twin boxes, each 15 ft. wide and 10 ft. 4 in. high,



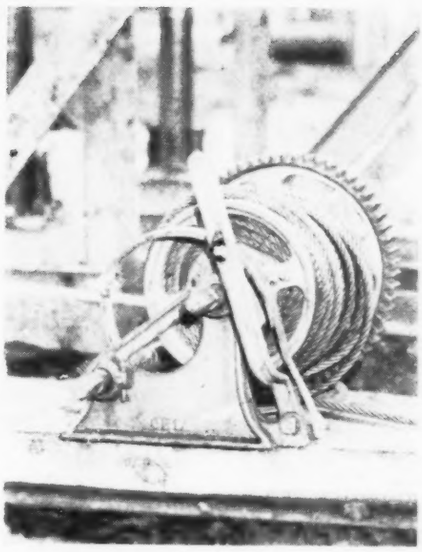
DOUBLE BOX CULVERT is designed unusually heavy to carry airport runways. Contractor pours invert first, then complete superstructure.

TRAVELING STEEL FORMS (below) speed up construction of big twin box drain at Lambert-St. Louis airport. Rail-mounted travelers, fitted with jacks, move collapsed form sections ahead.



ANGLE BRACKET for supporting outside wall form panels is fastened to invert through lag screw and expansion sleeve assembly. Sleeves are embedded in invert concrete.

FRED WEBER, JR., contractor on the project, keeps close track of the job through daily visits.



HAND CABLE WINCH added to travelers eases job of moving forms.

with a common center wall. Wall roof and floor thicknesses are shown in the accompanying drawing for the heaviest section under the runways. For sections not under runways the floor, roof and outside walls are thinner by 6 in., though the center wall remains the same.

Specifications permit the culvert to be poured in three sections: invert, walls and roof. The contractor, however, elected to pour in two sections, the invert first, carried well ahead of the box, and three walls and roof together.

Dragline Excavation

Excavation is comparatively light, consisting mostly of widening and trimming the banks and leveling off the bottom of the old channel. A Lorain crawler crane fitted up as a dragline, easily keeps excavation ahead of concreting. All spoil is piled along the right bank for subsequent backfill, while the top of the opposite bank is kept clear for an access road.

To keep the invert concrete out of the mud, a layer of crushed stone is placed over the creek bed prior to placing of bottom forms and reinforcing.

Blaw-Knox furnished steel forms for both the invert and the boxes. Because inside dimensions of both heavy and light culvert sections are the same, one set of forms is sufficient. Invert forms are simple low sidewall sections.

The twin box forms are independent, except for tying across the top between outside walls, though the two boxes are poured as a unit. Inside forms consist of three 30-ft. sections; outside panels are in 15-ft. lengths. Gore sections of various tapers are inserted between form units for curves in alignment.

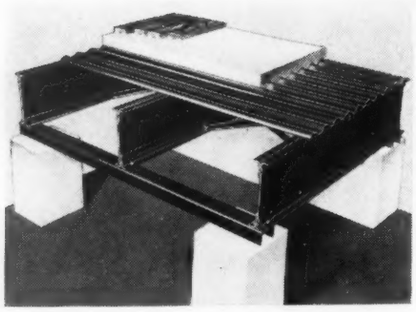
Invert concrete is carried well ahead of the boxes. A railroad track is laid on the invert at center of each barrel to carry 15-ft. travelers that move the inner forms ahead. The travelers are fitted with hydraulic jacks for lowering the form sections to clear the side and top. Each section, hinged at top corners, is collapsed by screw jack knee braces. The contractor added a hand-operated cable winch to each traveler as moving power.

Outside form panels are handled by a Lorain truck crane, which can lift a 30-ft. section on the near side

(Continued on page 156)

WHEN FLOODS THREATEN (below), contractor lifts travelers and all other loose items out of cut, for creek uses entire channel on such occasions.

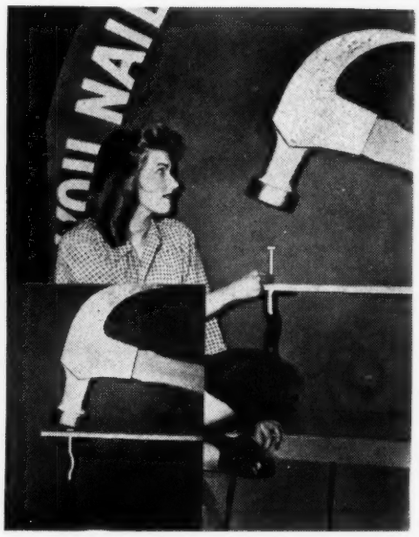
Wood Fastened to Steel by Nailing



CUTAWAY SECTION shows how nailable steel framing is used to supplant scarce lumber in residential and light industrial construction. Joists are screwed to channel plates. Clip-on bridging supports joists. Steel sheeting, over which concrete floor slab is poured, is nailed to Stran-Steel joist and hardwood finish flooring is then laid on concrete.

NAILABLE STEEL FRAMEWORK which makes it possible to use steel instead of wood for frames of dwellings was demonstrated at the recent National Association of Home Builders convention by the Stran-Steel Division, Great Lakes Steel Corp., of Detroit, Mich. The metal's uniformity, strength, durability and fire resistance are made applicable to the light building field by framing sections with grooves into which regular nails are driven and holes into which screws are turned, enabling assembly by regular carpentry methods.

Structures framed with Stran-Steel include single dwellings, apartment houses, commercial buildings and churches.



GIANT HAMMER AND NAIL demonstrate how carpenters nail to steel in animated mural at building show exhibit. As 36-in.-long hammer swings down, 12-in. nail enters board and 18-in. cross-section of joist. Three successive blows "drive" nail its full length into curved nailing groove, showing how nail is deformed and clinched by steel framework.

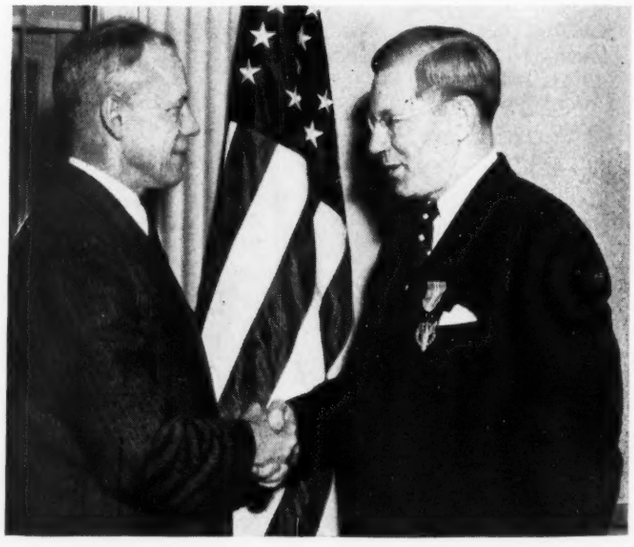
Frank R. Creedon Receives Highest Civilian Award

FOR OUTSTANDING SERVICE in construction during the War, Frank R. Creedon was presented the Medal For Merit, highest civilian award, by Secretary of War Patterson on March 5, 1946, in the presence of 45 generals in Washington. The citation was made in recognition of Mr. Creedon's achievements as project manager for Stone & Webster Engineering Corp. in building the atomic bomb plant at Oak Ridge, Tenn.

The following citation, signed by President Truman, accompanied the medal:

Frank R. Creedon, for exceptionally meritorious conduct in the performance of outstanding service to the War Department, in brilliant accomplishments involving great responsibility and technical construction ability in connection with the development of the greatest military weapon of all time, the atomic bomb. As Project Manager directing construction of one of the largest and most vital plants for the production of material for use on this project during a crucial stage of the program, between 1944 and 1945, his driving force and energy, his technical experience and skill, his diplomatic handling of difficult situations, and his unswerving devotion to duty contributed immeasurably to the attainment of the objective. Mr. Creedon's accomplishments reflect great credit upon himself and upon the military service.

Earlier in the War period Mr. Creedon served with the Construction division in handling contracts for ordnance plants throughout the country. He has just been appointed to the War Assets Administration, where he will direct the disposal of surplus construction and other heavy equipment as Director, Capital and Producers Goods Division.



FRANK R. CREEDON (right) is awarded the Medal For Merit by Secretary of War Robert Patterson.

PLYWOOD BRIDGE REPLACES MOVING VAN

SPANNING CLEAR OF ALL TRAFFIC, movable plywood box girder bridge carries conveyor for moving contents of five-story Portland (Ore.) building to new location across the street.

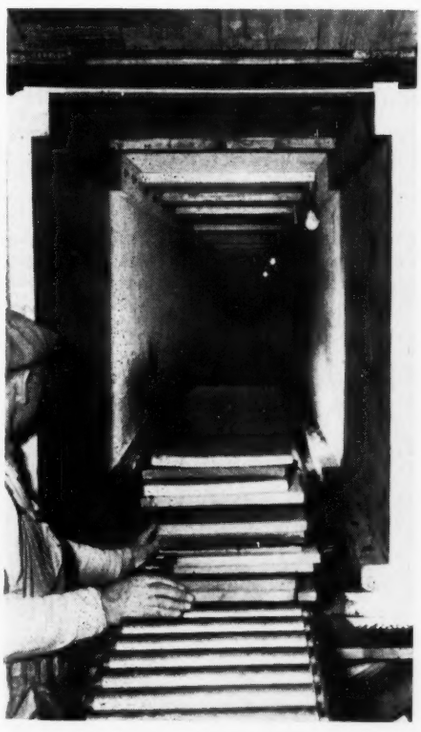
IN THE CLEAR OF ALL TRAFFIC, five floors of household crockery were moved from one building across the street to a similar building in Portland, Ore., on roller conveyors set in a movable plywood box bridge spanning the street. The bridge, designed by structural engineer Jerome A. McDevitt, and built by Wegman & Sons Const. Co., for the M. Seller Co, all of Portland, cut the cost of moving to one-third that of conventional methods.

The bridge, 2 ft. 9 in. wide and 4 ft. high, was built up of 1¼-in. plywood sides and bottom with a ¾-in. plywood top. Designed as a box girder, the upper chords were formed of 2x6-in. timbers bolted to both sides of each plywood web member, while the lower chords were made up of 3x3-in. rails on the inside and 2x8-in. timbers on the outside. The structure was stiffened with exterior wood struts on all four faces, and by exterior plywood gusset plates on the side webs.

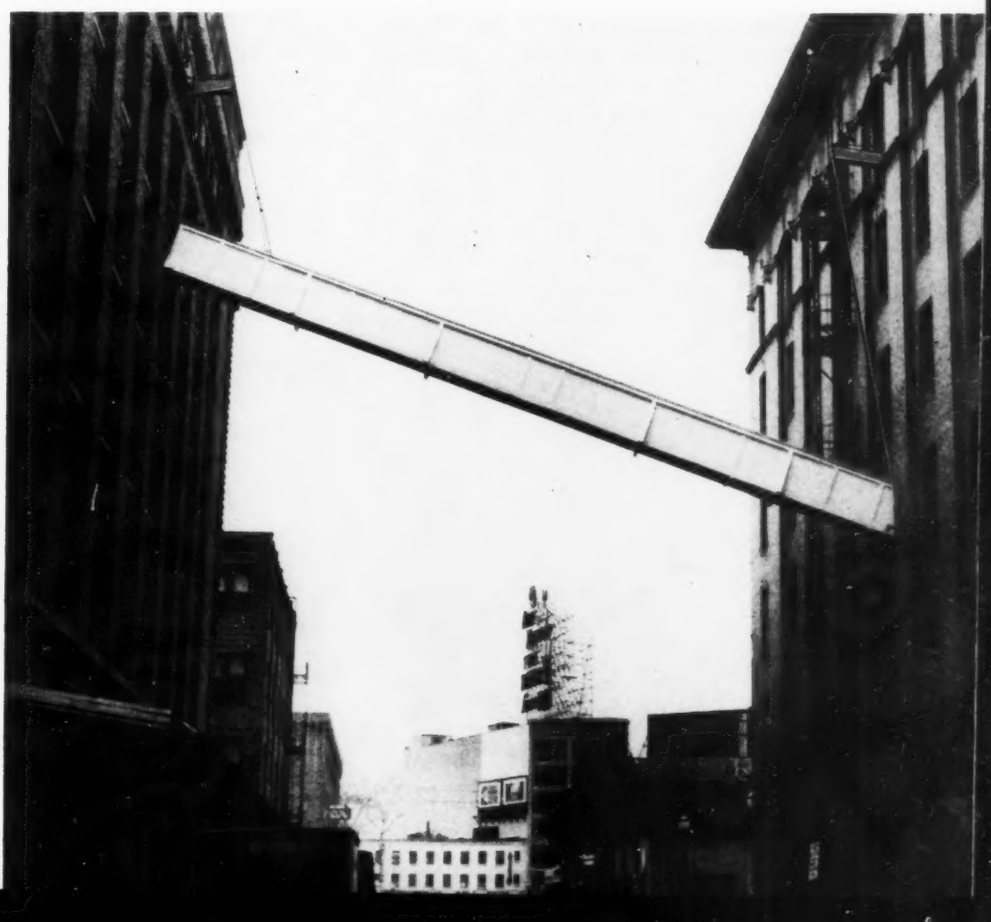
Erected inside one building, the bridge was set in place by sliding it out of a window with the aid of cables operating through gin poles extending out from top-floor windows. The bridge was moved from floor to floor by the same handling system.

Moving operations were aided by the fact that the floors in the new building are slightly lower than corresponding floors in the old building. Boxes of merchandise thus moved by gravity over roller conveyors carried on the bridge floor.

ROLLER CONVEYOR SYSTEM (below) moves material and merchandise by gravity to slightly lower floors of new building.



AS FLOORS ARE EMPTIED bridge (below) is lowered on cables reeved through pulleys on gin poles. Six men handle cables in this operation.



CONCRETE FOOTINGS ANCHOR STEEL TOWERS

POWER-DRIVEN AUGER drills hole for cast-in-place concrete footing for steel towers.

SURVEYING INSTRUMENTS are used to set stub angle of tower accurately in position. At top of ridge is another stub angle which has been set and braced ready for concreting.

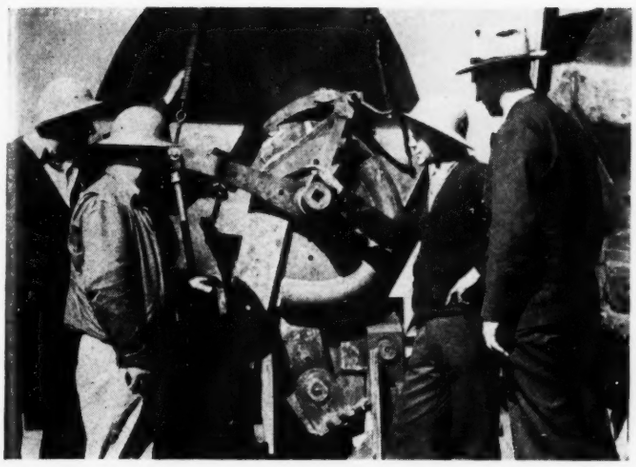
CAST-IN-PLACE CONCRETE FOOTINGS have been successfully used by the Southern California Edison Co. to anchor steel towers supporting its third transmission line from Boulder Dam to Los Angeles. Their use reduces the high cost, time and manpower required to dig the 5-ft. square holes required for steel footings used on previous lines, as well as providing a more permanent footing by eliminating corrosion of the buried steel.

Installation of the concrete footings is simple. A hole 18 to 36 in. in diameter is drilled by a power auger to a depth of 9 to 15 ft. The width and depth depend upon the ground formation and type of tower to be erected. Water soaking of the hole site prevents cave-ins. Next a steel reinforcing cage, 6 in. smaller diameter than the hole size, is centered in the hole and the stub angle of the tower is accurately positioned and braced in the hole. Surveying instruments are used in setting the angles to insure the required 1/100-ft. tolerance.

Concrete is poured by gravity down a jointed trough from the mixer to the hole form, which lines the footing for the upper 2½ ft. only. Wetting of the earth surrounding the newly-poured concrete and use of curing compound on the exposed surfaces prevent too-rapid curing.

CONCRETE IS POURED via trough from mixer to hole (below), which is kept moistened after pour is finished to avoid too rapid curing.

BOULDER DAM third transmission line towers (below) are carried on permanent concrete pedestal footings poured in drilled holes. Stub base angle is cast into concrete.



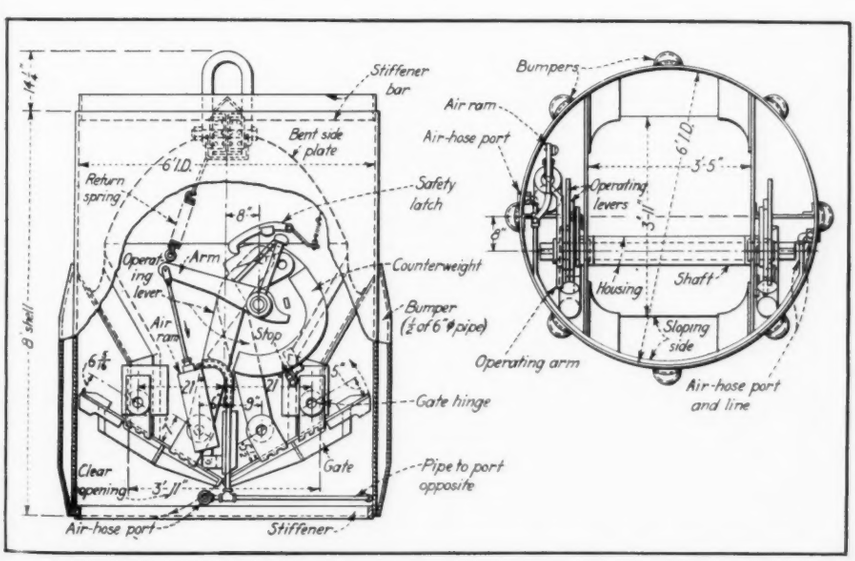
WORKING MECHANISM of new concrete bucket designed for Fontana Dam is examined by, left to right, A. H. THOMPSON, general garage foreman; ARTHUR C. KNOLL, master mechanic who supervised construction of buckets; FRED JONES, general machine shop foreman; and DALE W. YAMBERT, senior mechanical engineer of TVA Construction Plant Division.

New Air-Tripped Concrete Buckets Saved Time at Fontana Dam

DESIGNED BY TVA and manufactured in its own shops, a concrete bucket, which dumps seven times as fast as the conventional type, speeded up construction of Fontana Dam. Tripped by compressed air rather than by a hand-operated wheel, the improved 4-cu. yd. buckets were developed by the TVA Construction Plant Division at Knoxville, Tenn., since no cylindrical buckets of this type were on the market. Compressed-air tripping had been used by the Tennessee Valley Authority at Norris and Hiwassee Dams, but on these projects the buckets swung free from cableways and did not have to be spotted precisely on each trip. They could, therefore, be square and the necessary counterweights could be hung on the outside, with no danger of being battered off.

At Fontana the buckets often had to be dumped close to the form, so a

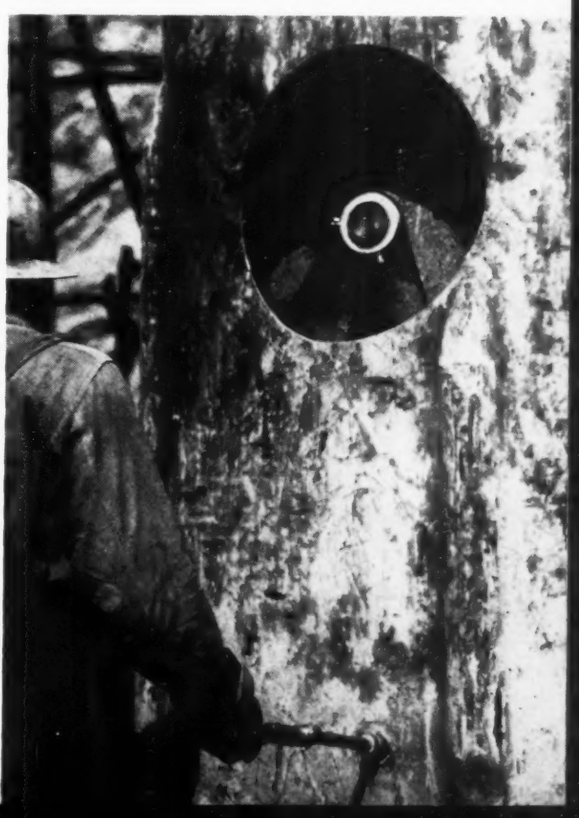
(Continued on page 160)



DETAILS OF TVA air-tripped bucket whichproved a timesaver at Fontana Dam.

TRIPPING MECHANISM, safety catch and curved counterweight are mounted outside bucket. Cylindrical protecting shell, shown below, which incloses bucket and tripper, is not yet in place.

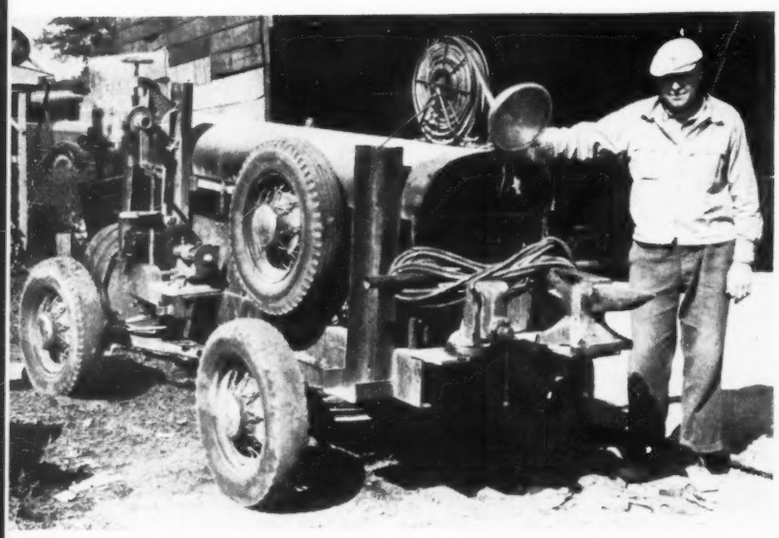
NOZZLE of compressed air line (below) is inserted in socket near base to trip concrete bucket in 2 seconds.



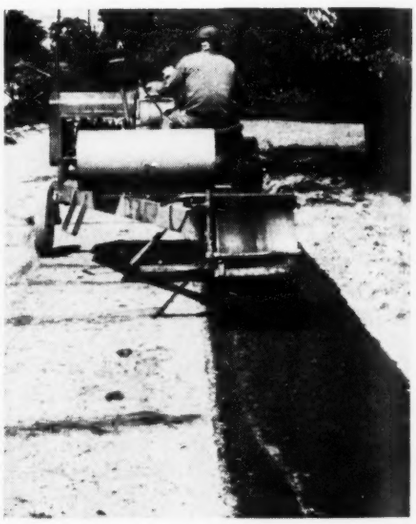
ROAD MAGNET picks up from 1 to 15 lb. of metal per mile on Minnesota highways. Built for state highway department by Stearns Magnetic Mfg. Co., it has 18x96-in. pole face and weighs 2,300 lb. Onan 3,000-w. portable electric plant driven by 7-hp. gasoline engine provides power.

HOW They Did It

CONSTRUCTION DETAILS For Superintendents and Foremen



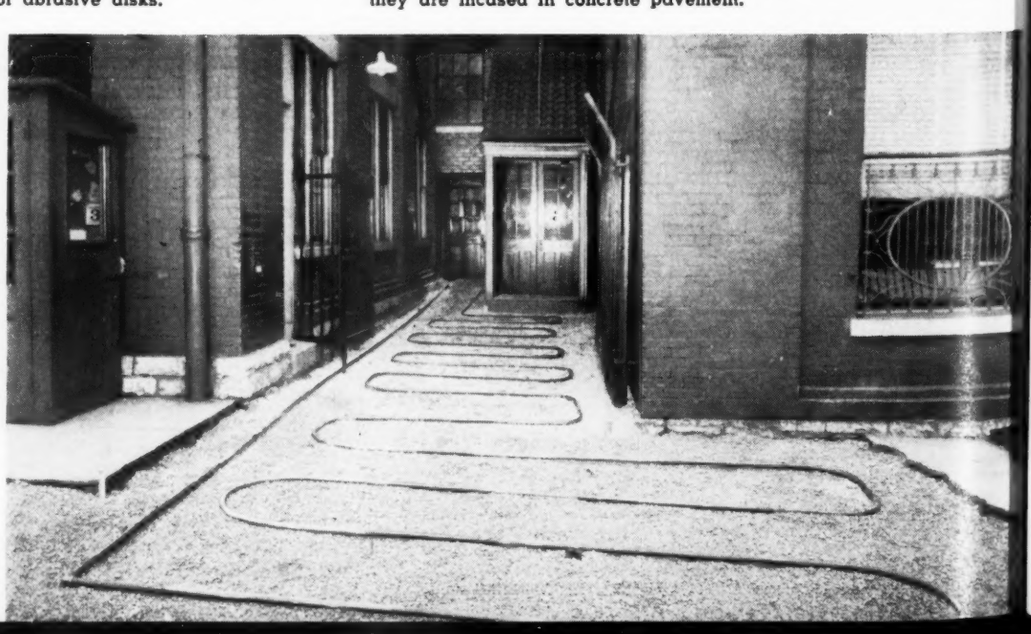
ACCESSORY TOOLS for job repairs are mounted on portable welding outfit of L. A. Davidson, Lansing, Mich., contractor for Michigan State Highway Department on Detroit Industrial Expressway, where KENNETH E. DAVIDSON (with hand on machine) is project manager. Attached to steel bench at rear of chassis are Parker vise and Trenton anvil; mounted at side are Buffalo Forge hand-operated drill press and rotary grinder and wire brush driven by belt from pulley on main drive shaft of gasoline - engine - driven welder. Reel on top carries hose for oxy-acetylene welding.



TRENCH ROLLER is used by Ohio Department of Highways to campact bituminous concrete on narrow widening strip inaccessible to standard roller.

OLD MORTAR BETWEEN BRICKS is removed by Mall tuck pointing saw (below, left) which drives abrasive wheel through 12-ft. flexible shaft from ¾-hp. electric motor. Cutting depth can be varied from 0 to 2 in., by adjusting 8-in. guard; 3 to 4 ft. of grooving per minute is possible. Advantages are less operator fatigue, because of light weight in workman's hands, and better control of grinding wheel, with reduced breakage of abrasive disks.

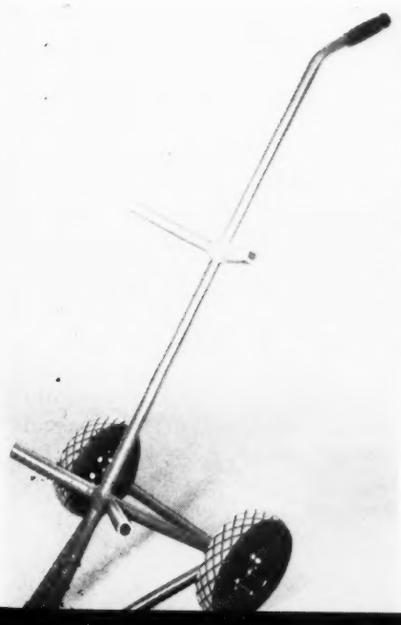
AMBULANCE ENTRANCE (below) at Wadsworth Watch Case Co. plant, Dayton, Ky., is kept free of ice and snow during winter by coils of Byers wrought iron heating pipe. After pipes are in place, they are incased in concrete pavement.



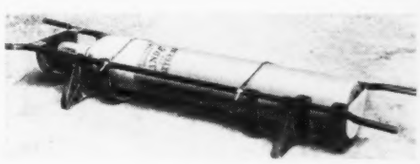
STRAIGHTENING BOWED STEEL CAP used on premolded expansion joint material in concrete pavement, crew of Bridgeport Core Sand Co., Saginaw, Mich., employs oxyacetylene outfit with Harris Calorific No. 6 tip to cut slots in flange and then to weld slots with steel rod. Gas cylinders are carried by job repair truck serving Bridgeport's contract for Michigan State Highway Department on Detroit Industrial Expressway.

MASTER SWITCH (top photo) insures simultaneous explosion (lower photo) of 30 tons of dynamite placed in 12,000 drill holes over 600x400-ft. area in construction of B-29 Superfortress runways in Marianas by Navy Seabees. U. S. Navy Photo

PRESSURE JACK, developed by A. E. KIRSTEIN, U. S. Bureau of Reclamation employee, supports pneumatic grinder, permitting one man to replace two-man crew for overhead grinding in 18-ft.-dia. steel penstocks at Grand Coulee Dam. Height of 6½-lb. jack can be adjusted by tension spring on telescoping support rod, set-screw arrangement similar to that on camera tripod, or adjustable screw at base which rests against basal support and has 2-in. range.



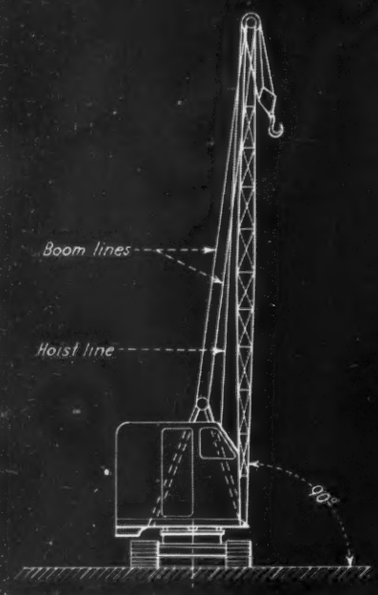
OXYGEN OR ACETYLENE CYLINDERS can be accommodated by light truck (left) and two-man carrier (below). Shop-made truck, which is easy to handle and load, is particularly useful in changing manifolded cylinders. Carrier has adjustable chains to hold cylinder securely in place and is valuable in rough and steep places. Welded angle iron cradle (right) reduces danger of damage in lowering cylinder from platform of truck. Linde Air Products Photos



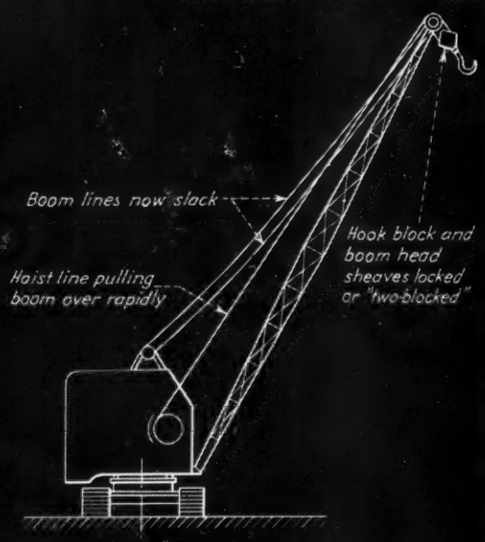
STOPS FOR PREVENTING CR

BY COMDR. F. F. KRAVATH (CEC), USNR
Public Works Officer, Naval Air Station, Coco Solo, Canal Zone

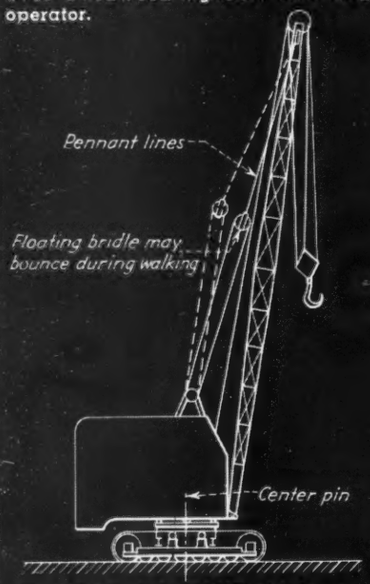
The opinions or assertions contained herein are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.



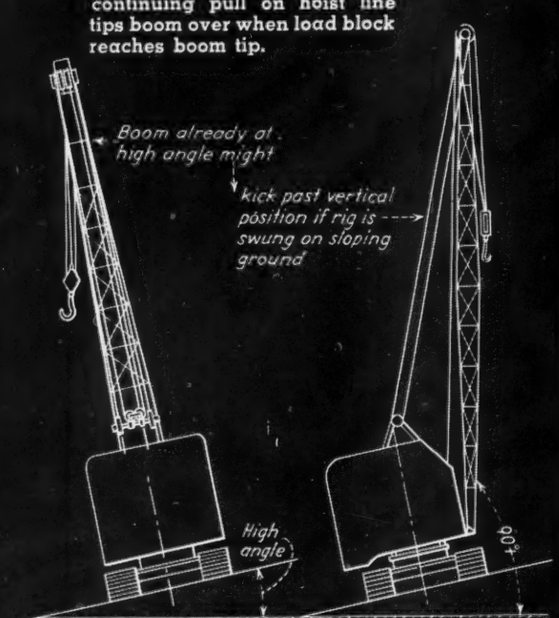
AN ACCIDENT ABOUT TO HAPPEN . . . Boom line is pulling crane boom over backward against cab and operator.



COMMON CAUSE of boom accidents is "two-blocking", where continuing pull on hoist line tips boom over when load block reaches boom tip.



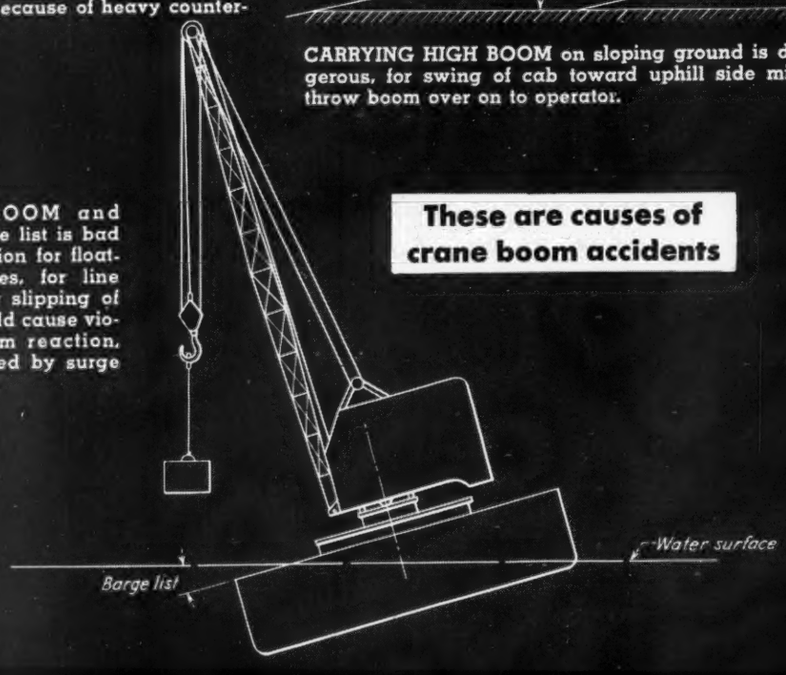
WALKING THE CRANE with boom carried high invites trouble, for if boom starts whipping it may kick over backwards. Traveling with high boom also puts strain on center pin because of heavy counterweight.



CARRYING HIGH BOOM on sloping ground is dangerous, for swing of cab toward uphill side might throw boom over on to operator.

These are causes of crane boom accidents

HIGH BOOM and sharp side list is bad combination for floating cranes, for line failure or slipping of load would cause violent boom reaction, aggravated by surge of barge.



WHIPPING OF CRANE BOOMS back past the vertical and over on to the top of cab is one of the most disastrous of crane accidents, for often someone is hurt, the boom is wrecked and the cab and operating mechanism are badly damaged. Causes of such accidents are many, but the remedy is simple—common-sense operation of the rig and the installation of one of several types of boom stops as a safety device.

Boom stops are devices for keeping the boom from tipping backward. They are best suited to medium-sized cranes, those in the 5- to 60-ton range, of the crawler, truck and barge or floating type. They are not necessary on the heavier walking type, gantry, gooseneck cranes, or big revolving rigs mounted on traveling or stationary towers. Furthermore, they are not needed on shovels, backhoes or draglines, though if such machines are convertible to cranes, it is good practice to mount an adequate boom stop on them to serve when the rigs are so converted.

Causes of Boom Accidents

Boom accidents fall into three classifications of causes: (1) Operating carelessness; (2) machinery failure, and (3) outside contributing factors.

Those which can be blamed directly on the operator are due to unfamiliarity with the particular rig or to incompetence or carelessness. Experienced and careful operators are seldom involved in boom accidents except in case of mechanical failure

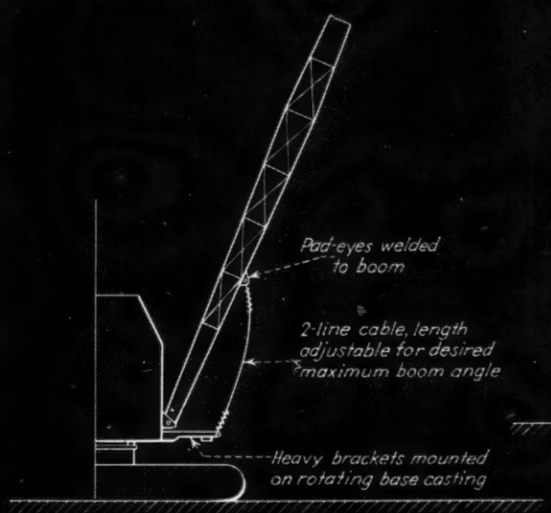
CRANE BOOM ACCIDENTS

or some contributing outside factor. Usually, accidents due to the human element occur while the operator is performing more than one operation and at a critical moment becomes rattled, or fails to notice the position of the boom or hook block, or forgets the exact location of the control levers. Thus, he may be booming up, lowering the hook and swinging at the same time, and in stopping the swing and load line, may fail to notice the critical boom position, or may forget which is the boom drive lever.

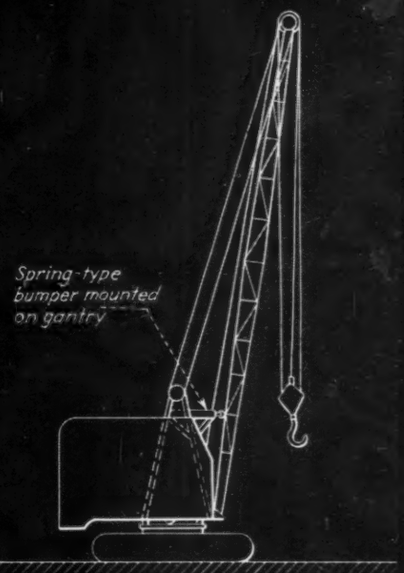
Again, he may be booming down, raising the load and swinging. This time his attention may be distracted for a moment from the position of the hook block which is rapidly approaching the boom head. The situation is right for "two-blocking," that is, the hook block collides with the boom point sheaves. Even though the boom may not be so high at the time of impact, the comparative speed with which the boom starts to come over, pulled by the fast-moving hoist line, (equivalent to single part line when two-blocked) is sufficient to rattle even an experienced operator. Few new operators will think quickly enough to merely disengage the hoist lever and step on the hoist brake.

Results of Improper Operation

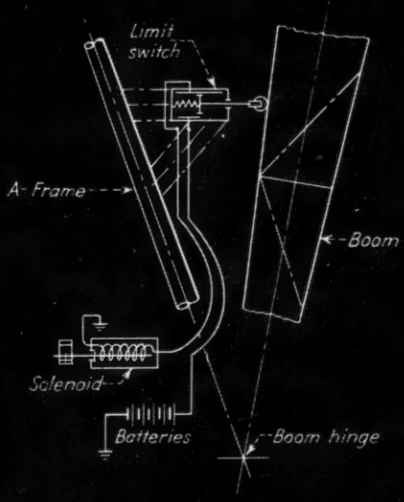
Another stupid, but all too frequent cause of boom accidents, is walking over rough uneven ground with a high boom and no load. This situation is worse if the crane has a long boom and floating bridle. Even if this practice doesn't result in a boom accident, it puts excessive strain on the center pin due to the bouncing of the counterweight. Still another human-cause accident results from the operator swinging unloaded, with a high boom, when the crawlers are on sloping ground,


Pad-eyes welded to boom
2-line cable, length adjustable for desired maximum boom angle
Heavy brackets mounted on rotating base casting

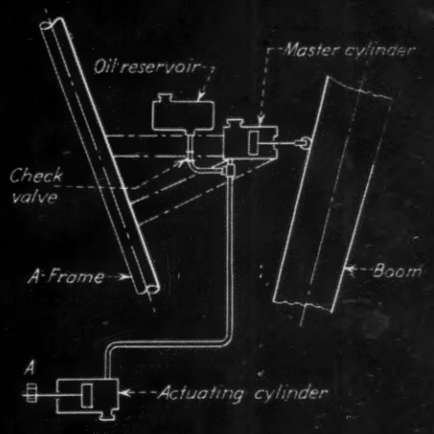
SIMPLEST OF ALL BOOM STOPS is pair of snub cables between arm extension on rotating base and point on lower boom frame.



SPRING BUMPER on gantry fram is most positive of all stops. It ca be incorporated into automati power cutoffs shown below fc more effective service.

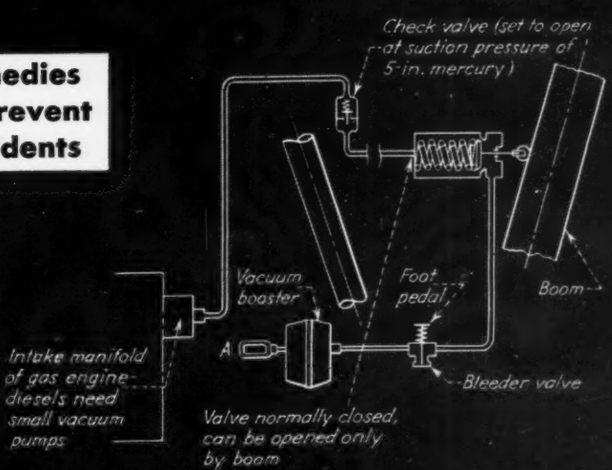


ELECTRICAL TYPE of power-interruption unit. Solenoid can be set to disengage master clutch, cut gas engine ignition or release diesel compression.



HYDRAULIC CONTROL interrupts power in same manner as electrical system through plunger "A"

These remedies will help prevent boom accidents


Check valve (set to open at suction pressure of 5-in. mercury)
Vacuum booster
Foot pedal
Boom
A
Bleeder valve
Intake manifold of gas engine—diesels need small vacuum pumps
Valve normally closed, can be opened only by boom

PNEUMATIC SYSTEM is easy to install on rigs equipped with air. Plunger "A" connects with engine controls.

for in such cases the boom angle increases on the high-side swing where it may pass 90 deg.

Most boom accidents resulting from machinery failure are due either to improper operation, or to "dragging" of the boom-drive, hoist or master clutches. Wet and damp weather is conducive to dragging, for most clutch linings swell when they become moist. Therefore, a clutch clearance ample for dry weather may become insufficient on rainy days with resulting dragging. In such cases the boom may start to rise, even if the boom-drive clutch is disengaged, when the master clutch is engaged, or, in more severe instances, both master and boom clutches may drag when the engine is started. Automatic boom brakes are effective only against accidental lowering of the boom, so do not come into operation on a boom rising due to clutch dragging. Sometimes clutch accidents occur when both hoist and master clutches are dragging and the hoist brake is not securely set. Then the load block rides up to the boom tip and a nasty boom accident is in the making.

Experienced operators will test all clutches on rainy or damp days for proper clearance and will make any necessary adjustments. However, all too many operators neglect such precaution, and accidents due to improper clutch adjustment happen with monotonous regularity.

There are several miscellaneous causes of boom accidents involving

(Continued on page 164)

Seabees Make Deep Well Pumps

WHEN A SHIPPING DELAY in pumps threatened a water shortage at the big Agana Naval Air Base at Guam, the 511th Construction Battalion Maintenance Unit designed and built two deep well pumps from salvage and stock materials. Though installed as a temporary measure, these pumps have proved most satifactory after months of continuous service in the original wells, 278 and 376 ft. deep.

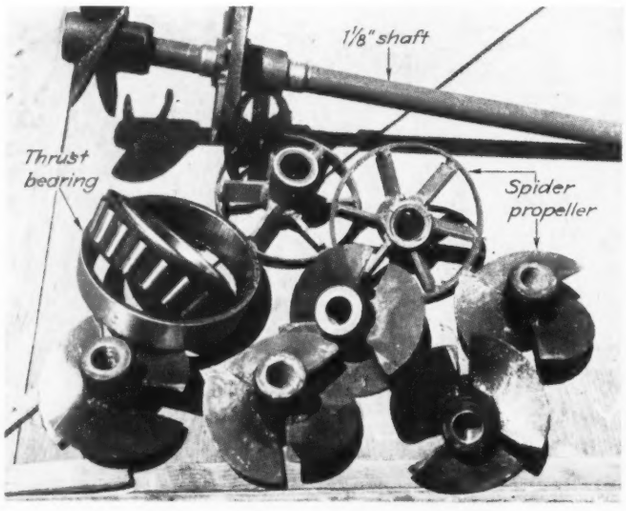
Except for size, the two pumps are identical. One is 4 in., with a capacity of 60 gpm.; the larger and deeper one is 6 in., pumping 400 gpm. Casings consist of 6-ft. lengths of 4-in. and 6-in. pipe.

Cold-rolled 1⅛-in. shafting was cut into 6-ft. lengths, with each length threaded at both ends. Between adjacent lengths of shafting was placed a 3-blade propeller, whose threaded collar acts as a coupling between shaft sections. The shaft is held in vertical alignment by a series of spiders welded to the top of each pipe length. These spiders are fitted with rubber-lined bearings, which, under water lubrication, have proved satisfactory. Thus, there is one propeller and one spider every 6 ft. throughout the depth of the well.

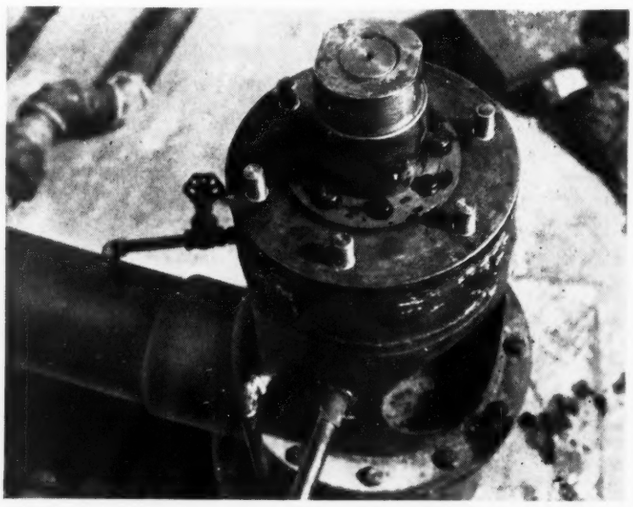
The drive head, mounted at the upper end of each well, was fabricated from large pipe and part of an oxygen gas tank. The thrust bearing, which supports the entire shaft and propeller assembly, is a conical roller bearing salvaged from a P-38 fighter plane.

Both pumps are belt-driven from diesel engines through a pulley set horizontally on top of the vertical shaft above the pump head. A foot valve was placed at the bottom of each well to permit filling of the pipe with water for lubrication of the bearings before the pumps were started.

Lt. Commander Oscar E. Hansen, succeeded by Lieut. John J. Kerwin, were skippers of CBMU 511, and Lieut. Kenneth M. Kent served as executive officer. Chief Petty Officer Chas. C. Roe made the pumps.



PARTS OF DEEP WELL PUMPS made by Seabees at Guam from salvage and stock materials. Propellers act as couplings for shaft. Spiders, with rubber bearings, hold shaft in alignment. Thrust bearing came from wrecked P-38 plane



SHORT NIPPLE OF BIG PIPE and part of an oxygen gas tank make up drive head containing conical thrust bearing. Drive pulley is attached to top of shaft above head.

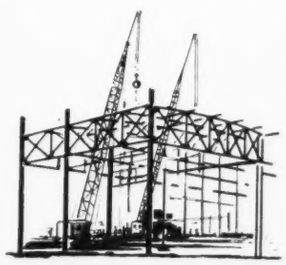
LEGAL ADVENTURES of TRACTOR CONN

By LESLIE JOBB

No contractor ever tries to be his own dentist or his own shoemaker. It is even more dangerous for him to be his own lawyer. There are, however, some legal rules which every contractor should know, and these rules may be explained in plain English without resorting to the jargon of the law, unintelligible to most laymen.

This series of articles, dealing with the Legal Adventures of Tractor Conn, a typical contractor anywhere in the United States, explains some of these legal points in plain language for the contractor. Each one is based on an actual decision of an American Court.

The Case of the Effective Attachment



Tractor Conn had agreed to erect a building for Jones. When settlement day arrived Jones claimed that Conn owed him $10,000 on another deal, Tractor Conn disputed the claim, and there the matter rested.

A year later Tractor Conn contracted to erect another building for another owner and sublet the steel work to Smith. It was agreed that before Smith was entitled to pay for any material put on the ground he must obtain the architect's certificate and approval. The morning after Smith put about $15,000 worth of steel on the ground, Jones drove by made some casual inquiries, and went to his lawyer's office.

"Tractor Conn has owed me $10,000 for more than a year and he's got enough material on that new contract of his to pay it two or three times. Make out whatever papers are necessary and attach the whole works," Jones ordered.

Then Smith demanded his pay for the material which he had furnished.

"Produce your certificate and you'll get your money," Tractor Conn told him.

"You know very well I can't produce a certificate. The architect never saw the material and can't now, for it's in the hands of the law," Smith pointed out.

"Produce your certificate," Tractor Conn repeated, Smith sued, and the Michigan Supreme Court ruled in his favor on the ground that Tractor Conn, through no fault of Smith, had put it out of Smith's power to furnish the required certificate.

The Case of the Ten-Percent Holdback

Tractor Conn had taken a contract to erect a certain building and sublet the foundation work to Doe.

"We'll have to have a clause in our contract that I am to retain 10 percent of your progress estimates to protect me from any liability to your employees," Conn suggested.

"No objection," Doe agreed, and signed the contract. He employed Roe to haul the sand and gravel and Roe rented a fleet of trucks from Poe.

"You owe me $500 for the rent of my trucks you're using and I must have my money," Poe declared a few weeks later.

"I can't pay you now," Roe told him, "but Doe owes me that much on my trucking contract with him, if I could get my money."

"Well, you assign your claim to me, and I'll see what I can do," Poe proposed and approached Doe with the assignment in his pocket.

"I can't pay a cent now, but Tractor Conn's holding 10 percent of all the work I do to protect him from my creditors. He has more than $1,000 of my money in his hands now and you have my permission and blessing to sue him as fast as you like. Better see your lawyer," Doe replied.

This happened in New York and Poe did not sue, as his lawyer advised him that there was a New York case where the Court had ruled in Tractor Conn's favor on the same state of facts, referring to the case reported in 39 Barb. (N.Y.) 567.

More Legal Adventures of Tractor Conn Next Month

HOUSE HATCHING MACHINE drops outside steel forms over inner form assembly, in which reinforcing door and window frames have been placed, at central casting yard. LeTourneau machine, called Tournalayer, consists of two-wheel U-frame trailer towed by two-wheel Tournapull tractor.

"Bungalow" Biddy Hatches Concrete Houses

CABLE HOISTS on Tournalayer (below) hold outside forms high as U-shaped trailer straddles inner form assembly to set outside forms in place. Access to inside to collapse inner forms after concrete walls and roof are poured is through ventilator holes in roof.

MONLITHIC CONCRETE HOUSES precast at a central yard and moved to final location by a gigantic tractor-powered machine are the R. G. LeTourneau Company's answer to fast housing construction. Both the houses and the method of their construction are highly unconventional. The machine which sets the outside steel forms, then lifts and transports the house after the walls, main partition and roof have been monolithically cast, has been named the "Tournalayer" by LeTourneau, but

FORMS ALL SET and ready for concrete. Tournalayer can not be pulled away until concrete has set for 24 hr. Paver on bank places concrete into forms with boom and bucket.

is fast becoming popularly known as the "Bungalow Biddy."

The houses are simple 4-room flat-roof bungalows, 24x30 ft. in outside dimensions, with 8-ft. ceiling height. Walls are 5-in. concrete, flared out at the bottom to 12 in. as a foundation base. The roof is a 7-in. slab dished to 5 in. at the center for drainage through a cast-in-place downspout. One 5-in. longitudinal center partition is cast with the house. Other partitions, dividing the bungalow into two 11x11½-ft. bedrooms, one 11½x16½-ft. living room, a 9½x12½-ft. kitchen and dinette, a bathroom and utility room are cinder block or wallboard on wood studs. Concrete floor slabs, containing piping for radiant heating, are poured in place after the house has been moved to its final location.

Walls and roof are reinforced with ⅜-in. rods spaced 12 in. each way, welded into mats. Openings are then cut in the mats for windows, doors, and two 18-in. ventilators in the roof. Additional reinforcing as an eight-sided loop of ¾-in. bars are placed around the openings. Single ¾-in. bars are set vertically in the corners, along a 4-in. parapet roof overhang and in the flared base.

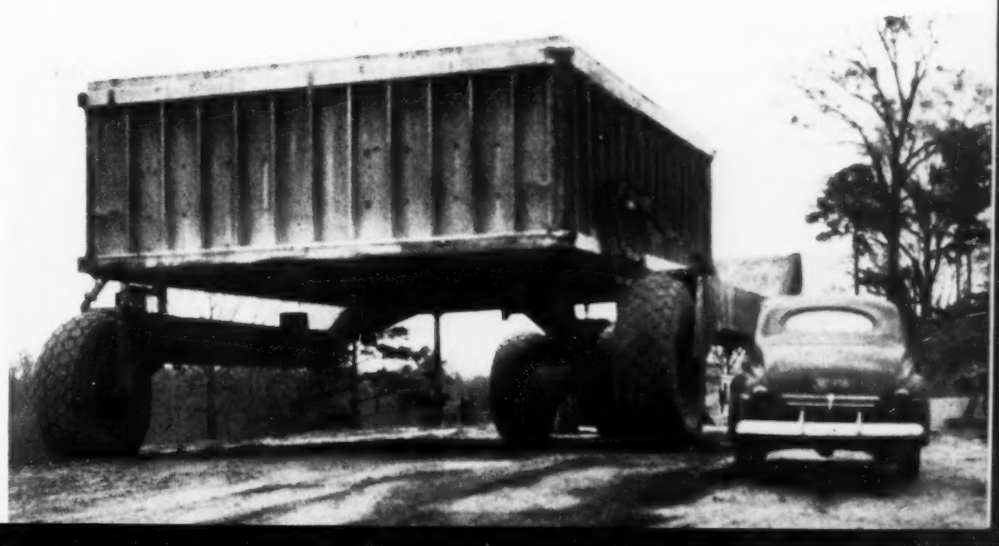
Interior forms, including the roof, are ¼-in. steel plate, stiffened with I-beam ribs and quarter-sections of heavy steel pipe at corners and ceiling lines, which leave rounded interior corners in the structure. The forms, joined at mid-point on the sides and at quarter-points at the ends of the house, collapse enough to permit the structure to be lifted clear. Access to the inside of the interior forms is through the roof ventilator holes.

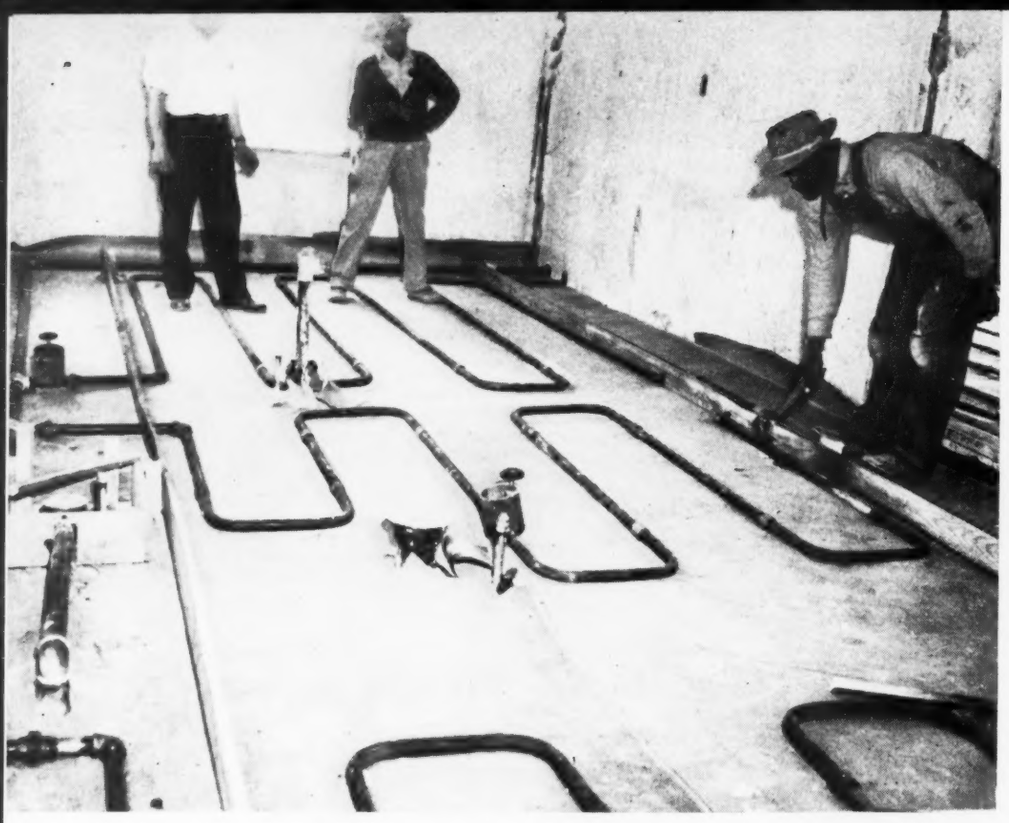
Outside forms are heavier, of ⅜-in. plate, stiffened by I-beam ribs, and made up in four sections, one for each wall. The sections are pinned at the corners by cams that open up for stripping. The bottom outside flare is reinforced to serve as a lifting beam for the whole structure.

Form-setting procedure is to erect the inner forms on a steel casting bed. Then the reinforcing and blocking for the openings are set. Next, the outer forms are dropped over the inside assembly by the Tournalayer. The two sets of forms are fastened together by ½-in. threaded bolt ties. After the concrete has been poured, these bolts are driven back out just far enough to clear the inner form shell, but remain in place as shear bolts to lift the structure when the Tournalayer raises and moves the house with outside forms still attached.

The Tournalayer, though huge

COMPLETED HOUSE SHELL (below) goes for a ride to final location still incased in outside forms. Gigantic size of Tournalayer is shown by comparison with automobile.





RADIANT HEATING PIPES are laid in lime bed on paper-covered cinder insulating fill ready for embedding in concrete floor slab. Lime counteracts possible pipe corrosion from acids in cinders. Floor is poured after house is in final location.

and ungainly in appearance, is simply a big two-wheel trailer frame towed and operated by a 200-hp. diesel two-wheel Tournapull tractor. Standing almost 14 ft. high, it is 51 ft. long and 35 ft. wide. The U-shaped carrying frame is built up of 28x46-in. steel box side pieces welded to a 30-in. pipe front piece. Tractor and frame are connected through a heavy vertical-pin assembly that bears directly on the tractor's single axle. The whole rig is carried on four 30x40-in. pneumatic tires (8 ft. 4 in. dia.), 34 ply and inflated to 45 psi.

Lifting power is supplied through three electric hoists and 8-part lines, one each mounted on the side frames just ahead of the rear axle, and at the center of the front frame. Power for the hoists comes from a 50-kva. generator on the tractor. The hoists have a lift of 10 ft., ample for the completed house to clear the inner forms, and the outer forms to clear the structure. Lower blocks on the hoist system fasten to the flared bottom of the outside forms.

Tractor and carrier combined weigh 35 tons. The heaviest lift, that of the house encased in outside forms, is about 120 tons.

Construction Procedure

Setting up the inside forms on the steel casting plate is the first step in manufacturing a house. These forms are painted with a special oil, selected after several experiments to yield the most satisfactory finish of concrete poured directly against the steel plates without liners. Placing of the reinforcing mats, door and window frames, and electric conduits, along with timber shores under the roof, is next. Then the machine drops the outer forms over the inner assembly, and the job is ready for pouring.

An elevated paver places the concrete directly into the forms with its boom bucket. Concrete, vibrated during placing, is made up of lightweight expanded slag (40 lb. cu.ft.) sand and quick-setting cement with a 1:2.4:4 mix, a design that gives a minimum 28-day compressive strength of 3,000 psi. After 24 hr. the inner forms are loosened and the house is ready for transportation.

The machine picks up the house, still incased in the outside forms, and sets the structure down at its final site, after which the forms are loosened and lifted clear of the walls. Since the flared base of the outside walls acts as a footing, no separate foundations are required. The concrete is cured for three days by water sprays.

Floors are installed after the house is in place. Over a 6-in. layer of insulating cinders are placed three thicknesses of waterproof paper, topped by a ¼-in. layer of lime to counteract possible corrosion of heating pipes by acids in the cinders. The radiant heating pipes are set on the lime and are then incased in a concrete floor slab. Radiant heating, combined with interior painting with white cement-base waterproof paint, and positive ventilation through slow-speed fans set in the roof ventilators, have eliminated interior wall sweating.

Bigger Rigs on the Way

At present LeTourneau is building 100 houses at the rate of three per 5-day week for his employees at the Vicksburg plant with the rig described above. Forms for a 24x32-ft. house with 9-ft. ceilings are to be made at a new plant at Longview, Texas, and corresponding larger Tournalayers will be manufactured at both Peoria and Vicksburg. LeTourneau does not plan to go into the housing business, but will lease the machine and forms, redesigned for shipping, to contractors.

Ray F. Gieszl, general manager of the Vicksburg plant, is directing that plant's housing project, and is responsible for this development of the forms and equipment used there. Joe Malik, his assistant, is in direct charge with Raymond Allen supervising the construction operations.

FINISHED PRODUCT is neat, compact four-room bungalow, shown here ready for occupancy. Sash, doors and plumbing are installed after house shell has been placed in final position.

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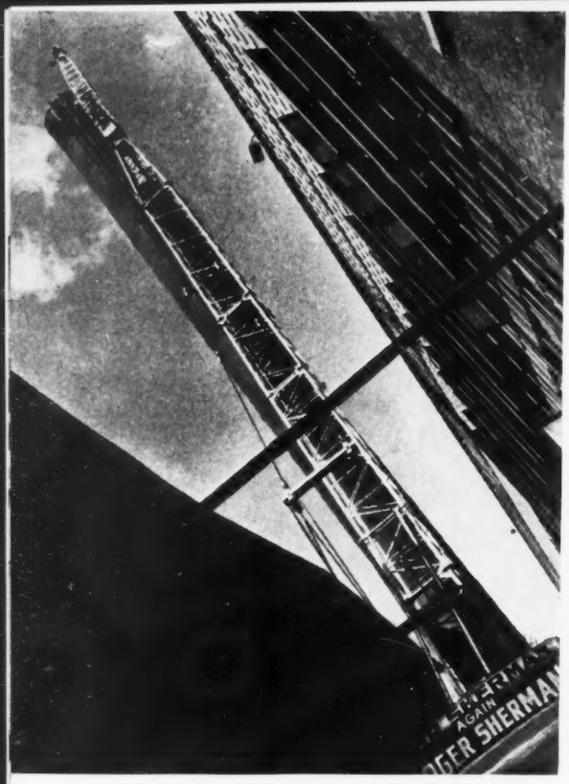
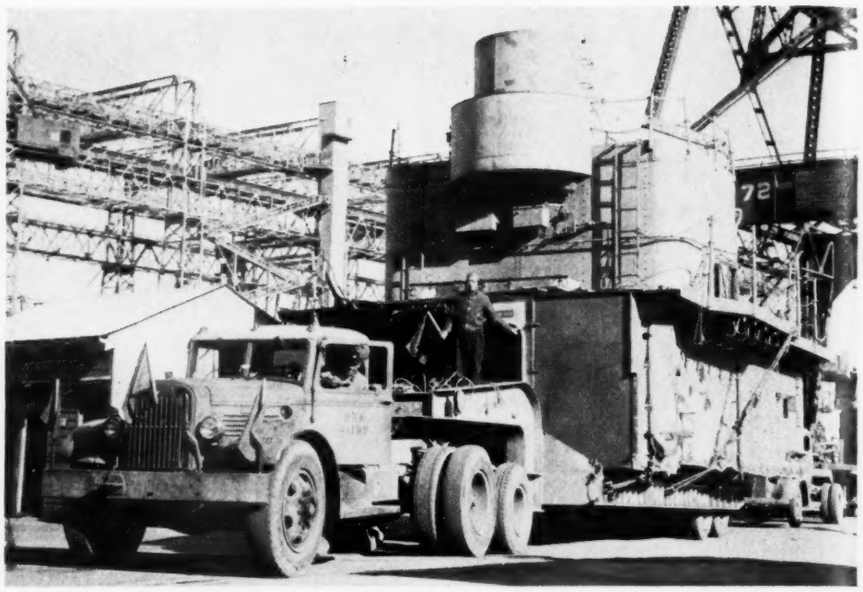


DISMANTLING 125-FT. CHIMNEY is accomplished with P&H Model 255-A truck crane with long boom. As steeplejacks slice off sections of steel stack at Bristol, Conn., plant, 110-ft. boom reaches up to swing each section clear, then lowers it safely to ground. Press Assoc. Photo

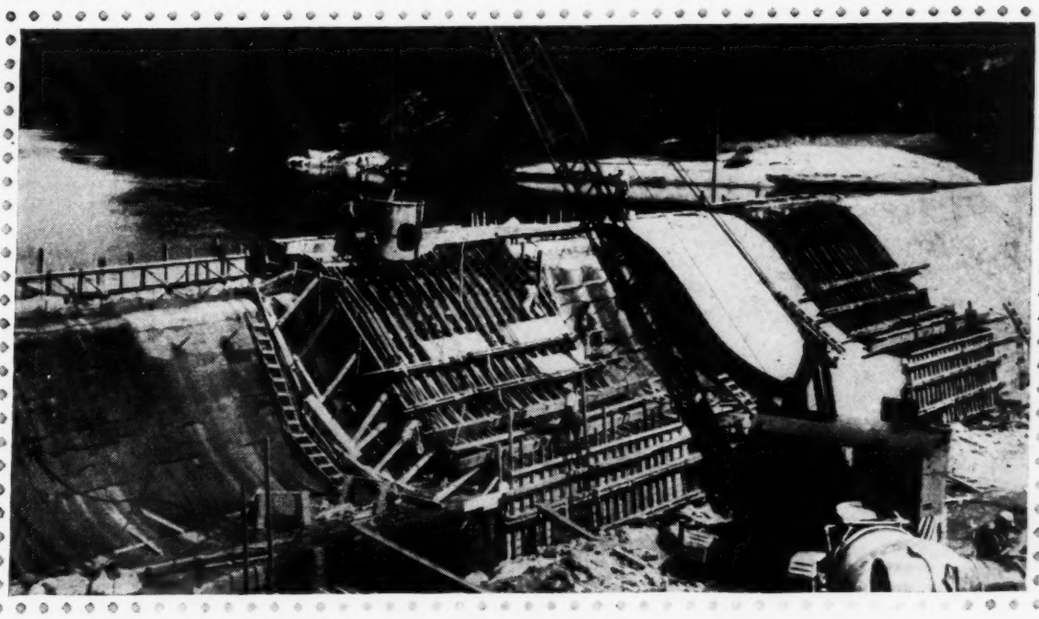


STRANGE LOAD for low-bed trailer is this 10-ton superstructure of U.S.S. Haggard. The destroyer, victim of Kamikaze attack at Okinawa, limped back to West Coast port, where it is being dismantled for scrap.

JOB oddities

GOLD IS PANNED in excavation for building in downtown Helena, Mont. Placer miner finds enough ore for estimated $1.75 per yd. yield but not enough to warrant ripping up adjoining street. Press Assoc. Photo

← RECONSTRUCTION CREWS RELAX after hard day's work on restoration of Russian town of Dnieproges, in shadow of Dnieper Dam, as amateur art circles give open-air performance for workers. Sovphoto



Repair Work on dam of Western Massachusetts Electric Co. which had been exposed to 40 years of alternate freezing and thawing. H. A. Moody, Hydraulic Engineer; Daniel O'Connell's Sons, Inc., Holyoke, Mass., Contractors; Duraplastic ready-mixed concrete furnished by Construction Service Company, Springfield, Mass.

Repairs to 40-Year-Old Dam made with AIR-ENTRAINED CONCRETE

A hydro-electric station of the Western Massachusetts Electric Co. had been exposed to the rigor of 28 winters. To repair it the engineers specified Atlas Duraplastic air-entraining cement.

The resulting concrete was so satisfactory that the engineer again used Duraplastic cement to repair a dam that had been exposed to 40 New England winters.

He states that—

1. **Duraplastic cement was used to fortify the concrete against freezing and thawing weather.**
2. **With this cement there was practically no segregation or bleeding.**
3. **This cement so improved workability that the entire surface is free from stone pockets and sand streaks.**
4. **Such a surface probably will longer resist the abrasive action of overflowing water.**

Atlas Duraplastic cement complies with ASTM specifications and sells at the same price as regular cement. Send for details. Write to Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building New York 17, N. Y.

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Present and Accounted For... A PAGE OF PERSONALITIES

EXPANSION of New York offices is announced by The H. K. Ferguson Co., engineering and construction firm. In charge will be: (1) **WELLS N. THOMPSON**, vice-president; (2) **G. E. MacMILLIN**, contract manager for eastern division who will direct sales and preliminary engineering; (3) **T. K. ROTHERMUND**, chief district engineer who will head expanded engineering department; and (4) **C. A. DRIVER** (right) who will supervise all construction along eastern seaboard and in New England.

NAMED SECRETARY OF INTERIOR to succeed Harold L. Ickes is **JULIUS A. KRUG**, former chief of War Production Board and once power engineer for Tennessee Valley Authority. After liquidation of WPB, he retired temporarily from public life to become engineering consultant.

RETIRING AFTER 53 YEARS of active participation in New York engineering firm of Ford, Bacon & Davis, Inc., is **GEORGE WOOD BACON** (below), 77, one of firm's founders and lately chairman of board.

CHINESE ENGINEERS (below) accompany U.S. Bureau of Reclamation consulting engineer **JACK SAVAGE** on tour of site of his proposed huge hydroelectric project in Yangtze Gorge.

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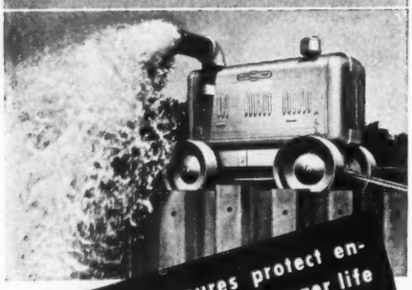

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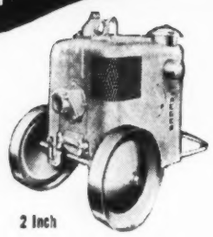

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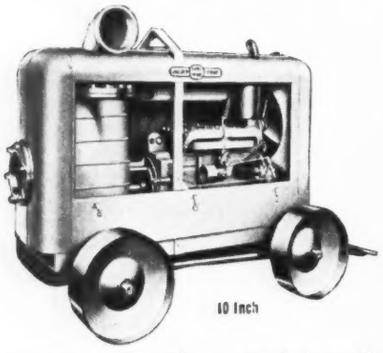

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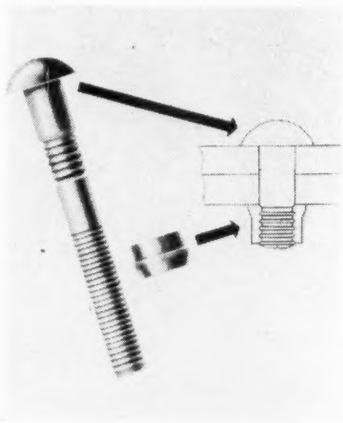
CONSTRUCTION EQUIPMENT NEWS

APRIL 1946 REVIEW of Construction Machinery and Materials

ONE-TON GENERAL PURPOSE TRUCK designed for economical "off-the-highway" use and operations over unimproved roads is adapted from four-wheel-drive military vehicle. It has 94-hp. engine, four-speed transmission, two-speed transfer case, conventional closed cab with built-in driver comfort, steel express body 8 ft. long, 4½ ft. wide and 22¼ in. high with special reinforced stake pockets, double-drop frame with side rail reinforcements, 126-in. wheelbase and choice of 9 or 7.5 eight-ply tires. It is designed for a maximum payload of 3,000 lb. with 9 tires. A dual power take-off is available to deliver 536 rpm. at tail shaft to operate many types of machinery or drive 9-in.-dia. belt pulley drive to power many items of auxiliary equipment at belt speed of 3,124 ft. per min. Power take-off also

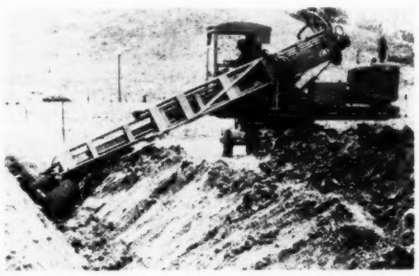
operates front-mounted power winch of 7,500-lb. capacity. "Power-Wagon" applications include: highway and airport building; conservation work; pulling road grader or road drag; spray painting; towing; and hauling. **—Dodge Division, Chrysler Corp., Detroit, Mich.**

NEW TYPE FASTENER, made of aluminum alloy, carbon steel and high-strength alloy and known as "Lockbolt," is said to be more quickly installed than standard bolts and to form a permanent fastening which cannot loosen under vibration or fatigue loading. No lock washers, cotter pins or special nuts are required. Provision for hole filling permits joints of maximum rigidity and uniform tightening is assured. Consists of two precision parts: (1) pin, which has head of any desired type, locking grooves, breakneck groove and pull grooves which fit jaws of driving gun; and (2) locking collar. Pin is inserted from back side of work, collar is slipped on to pin and gun is applied. Gun squeezes work together between collar and head of pin; wire draws pin to press fit in hole when hole filling is required; swages collar into locking grooves in pin; breaks pin off flush



with collar and frees itself from swaged collar. Both hand-operated and pneumatic guns available. Lockbolts offered in two types: (1) for applications requiring hole filling (to replace rivets and close-fitting bolts), and (2) to replace bolts in clearance holes. Supplied in 3/16-in. dia., with grip lengths ranging from 1/32 to 21/32 in. Bolts of ¼ and 5/16 in. dia. will soon be available.—**Huck Manufacturing Co., 2480 Bellevue Ave., Detroit 7, Mich.**

GRADING MACHINE, called "Gradall," permits earthmoving in places not easily accessible to excavating equipment. Hydraulically operated, it has expandable 24-ft. boom of arc-welded construction. — **Warner & Swasey Co., Cleveland, Ohio.**



LOAN TO BRITAIN

. . . Investment in World Economic Unity

CONGRESS should give swift and confident approval to the proposed loan to Great Britain.

Few other issues of foreign policy in the present troubled world lend themselves to such clear appraisal of where our National interest lies.

In simplest terms, the question is whether we should extend to Great Britain a credit of $3¾ billions (plus $650 millions in payment for lend-lease balances) in return for her promise to repay principal with interest over a fifty year period starting at the end of 1951, and her pledge to give the fullest possible support to the kind of world trading system which it is the declared policy of both the United States and the United Nations Organization to promote.

We Can Afford to Make It

The sum we hazard is not inconsiderable, but financial risks have meaning only when related to resources. The line of credit provided by the loan will amount, at most, to a claim on 2/5 of 1 per cent of our gross output for the five to six year period over which it may be used. The interest rate charged, while moderate, is higher than our Treasury is paying upon current borrowings. The risk entailed is well within our resources as a creditor. In the considered judgment of the American and British technical experts who thrashed through the intricate accounting for three painful months, the amount and terms offered will suffice to allow Britain, under rigid austerity, to relax her system of foreign trade restrictions, and to expand exports sufficiently to pay her debt commitments.

Against the considered risks of extending the loan, there must be weighed the certain costs of refusing it. Without the loan, Britain has no recourse but to maintain and extend the system of bloc trading which she adopted under stress of world depression and world war. If that is the route Britain follows, she will carry with her a large part of the sterling area countries — all British Commonwealth and Empire countries (except Newfoundland and Canada) plus Egypt, Iraq, and Iceland—and many of the nations with which the United Kingdom has payment agreements (Argentina, Bolivia, Brazil, Chile, Paraguay, Peru, Uruguay, Belgium, Czechoslovakia, Denmark, Finland, France, Netherlands, Norway, Portugal, Spain, Sweden, and Turkey).

Altogether, the United Kingdom's orbit accounts for more than half of the world's imports and exports combined. It likewise is crucial to the trade of the United States. In the years immediately preceding the war, the sterling area and payment-agreement countries provided just under one-half of both the import and export trade of this country.

Russia, of course, will continue to conduct her foreign commerce exclusively upon a state-trading basis. Before the war, the Soviet Union transacted only a little more than 1 per cent of foreign trade business, but its future sphere of influence will be large—conceivably embracing as much as 30 per cent of total international trade.

We Cannot Afford to Refuse It

If the weight of British influence in foreign trade is thrown toward the Russian pattern rather than toward ours, it is apparent that bloc trading, with all of is supporting devices—bilateral deals, exchange controls, import and export quotas, subsidies, currency manipulations and the like —will be the prevailing pattern for foreign transactions.

In self-protection, the United States would have no alternative but to conform to the dominant pattern. We should be forced to form our own bloc, and to enter into active economic warfare in bidding for trade concessions against the offers of our rivals. How well we would do this is problematical. To the game we would bring the largest economic potential in the world. But our handicaps would be equally impressive.

First, under a system in which political and economic motivations are inextricably fused, a democratic nation, and particularly one with a tradition of freedom in its domestic enterprise, would operate at a great disadvantage. We should inevitably be driven toward more and more government control of our entire economy.

Second, with a pattern of foreign trade in which our exports habitually are greater than our imports, our bargaining position in international trade is much weaker than our over-all economic strength would suggest. Under state-controlled trading we should still find it difficult to compete successfully without resort to loans, and under these conditions our loans would be supporting a system alien to our choice and interest.

Third, under a regimented system which made economic decisions subservient to political considerations, it is virtually certain that the volume of world trade would shrink. That was the clear experience of the nineteen-thirties. Thus, the

standard of living in the United States would suffer in common with all others, and we would be forced into a particularly drastic curtailment of certain war-expanded segments of our economy, at the very time when a large portion of the world is most in need of the products they can produce.

Weighing the Alternative Costs

In the years immediately ahead it is certain that from two-thirds to three-quarters of all international trade will be transacted either in pounds or dollars. If both circuits are linked in a determined effort to restore competitive world markets, to which buyers and sellers alike have access without discrimination, that will be the dominant system of foreign trade. If the sterling group with its satellites organizes a closed grid, our exclusive effort cannot preserve the trade pattern that we believe offers most to us and to the world.

No one can accurately measure the costs to the United States of refusing the loan and accepting the consequences. But unquestionably they would dwarf to insignificance the sum risked in the proposed credit. We would lose through the shrinkage of our trade, through the wrench of violent readjustments in our production patterns, and eventually through the curtailment of our over-all output below what it would be under an open rather than a closed system. We would lose heavily in economic liberty under a procedure that can be followed with success only by a close regimentation of production as well as trade.

Most of all, we would lose in prestige, through demonstrating that we are still unprepared to exercise a world leadership to which our giant stature as the possessor of almost half of the world's economic capacity entitles us. Once again we would be exhibiting to the world political feet of clay supporting an economic frame of heroic proportions.

It Is Far from a "Soft" Bargain

There has been some disposition in this country to regard the loan to Britain as a somewhat "soft" and generally unprecedented transaction that smacks of charity. This is the sheerest nonsense.

In the first place, the kind of economic system we want has never functioned and cannot operate now without a lender. For many decades prior to World War I Great Britain filled the creditor role. In 1913 her foreign investments totaled $19 billions, and she not only made such transactions pay, but they proved her salvation through two grim wars. Her credits helped in the industrial development of a large segment of the world, including the United States. Of all the nations in the world, only the United States can assume now the mantle which Britain no longer can support.

In the second place, the terms of our proposed loan to the United Kingdom are far from easy. Britain put a substantially greater proportion of her relatively meager resources into the war than we did, and dissipated a large share of her foreign holdings in the process while accumulating an outside debt of crushing magnitude. On a per capita basis her internal debt is greater than ours. Many Britons feel that our proposed loan is too small, and its terms too rigorous. If the amount proves to be inadequate, we shall have to consider supplemental aid at a later date. But the majority believe that the present offer gives a fighting chance to restore the system of world trade that we and they both want, and upon which the World Bank, the Monetary Fund, and the International Trade Organization under United Nations aegis are based. It is certain that without our loan all of this will go by the board.

In the third place, our proposed loan is far from being without precedent. Canada, which is linked by far closer economic ties to us than to the Empire, already has provided for a loan to Britain of $1,200,000,000. This amounts to almost a third of what we propose to lend, although Canada's population is less than 10 per cent, and her income is little more than 5 per cent of ours.

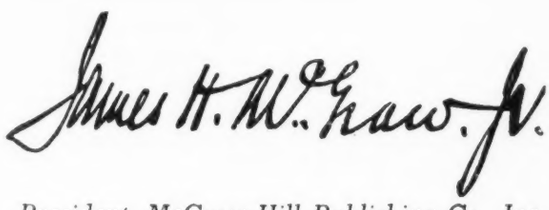
Shall the United States Lead or Follow?

The way to exercise leadership is to lead. Nothing could be more futile than to go half way toward establishing the economic order for which we stand, and then withhold the crucial measure that will make it work. Failure to approve the loan to Britain will be a clear default of leadership. Failure to approve it promptly will dissipate its effectiveness.

It has been officially stated that the British loan is a unique case that will establish no precedents for further credits to other nations. It is exceptional in its importance to our aim. But if the United States expects to make its economic program the dominant one for world trade, it must continue to exercise the creditor function without which that program cannot persist.

The most that we should ask is that future loan transactions be scrutinized as was this one to see that they offer comparable security and comparable return in support of the program for which we stand.

For the loan to Britain, it can be said that never before has one nation had an opportunity to gain so much at so little risk as has the United States in this uniquely decisive case.



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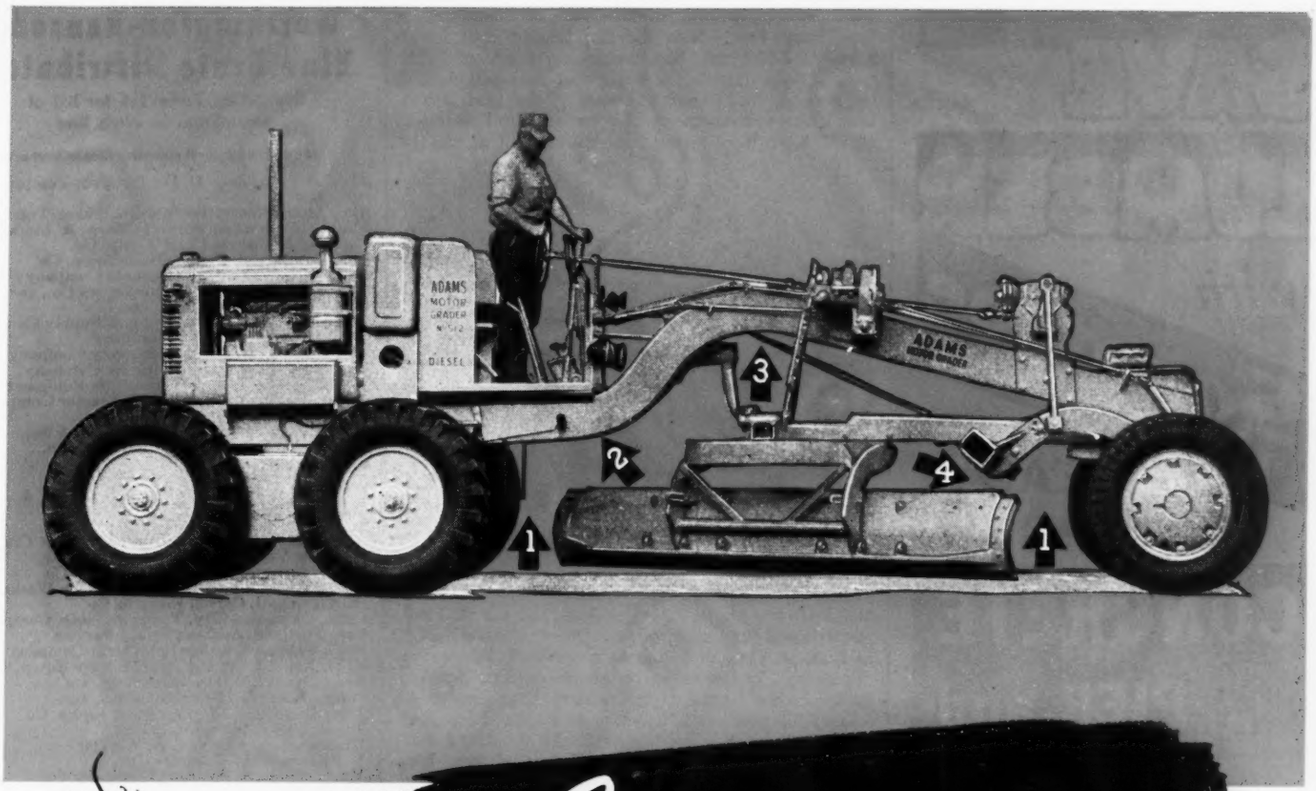

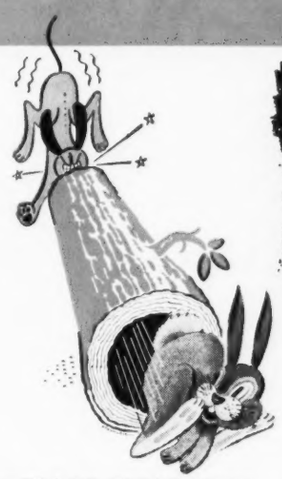

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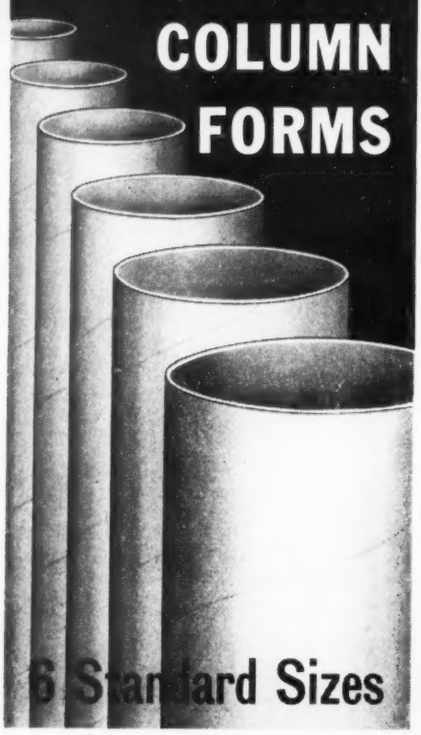

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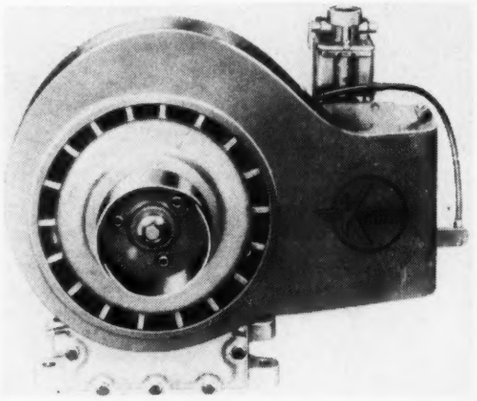
EDENSHAM, N. C. GARWOOD, N. J. LOWELL, MASS.

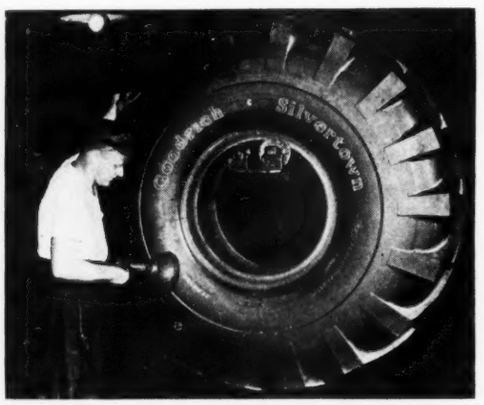
5-HP., ALL-PURPOSE AIR-COOLED ENGINE, called the "Busy Bee," is a 4-cycle, L-head unit rated 5 hp. at 2,600 rpm. but developing 6 hp. at 3,250 rpm. Single cylinder is horizontal and detachable for making maintenance easier. Bore and stroke 2¾x3 in.; displacement 17.8 cu. in. Unit requires only 2.4 cu. ft. of space. Engine is light of weight



because aluminum alloy is used in crank case, piston head and rear cover. Power take-off shaft is 1 in. in dia., and rotates counter-clockwise facing shaft. Torque curve on engine is flat. Bearing surfaces are large with bearing pressures kept low. Full pressure lubrication is supplied by positive, high pressure oil pump. All bearings hardened to give longer wear.—**Kinner Motors, Inc., Glendale 4, Calif.**

SUPERCHARGING OF GAS ENGINE and instantaneous conversion from use of either oil or gas fuel are made possible by new engineering development. In tests by company, LS-8 cylinder gas-diesel engine with ordinary rating of 1,100 hp. was supercharged to rating of 1,600 hp. at 327 rpm. When engine was changed over to gas on full load, exhaust temperatures were decreased and turbo-charger speed was lower. Supercharged engine provides more power for given space and weight. It also makes possible better fuel economy, since it provides better overall thermal efficiency than atmospheric diesel.—**Cooper-Bessemer Corp., Mount Vernon, Ohio.**

MAN-MADE RUBBER, known as GR-S-10, furnishes longer, more uniform tire life. Features are greater resistance to cracking and carcass bruising; cooler running; better tread wear; and ability to withstand higher speeds. Uses rosin base soap as



emulsifying agent and is butadiene-styrene type. Tires made with this rubber have already undergone more than 3,000,000 mi. of intensive testing under all road and climactic conditions.—**The B. F. Goodrich Co., Akron, Ohio.**

Worthington-Ransome Blue Brute Distributors

See ad on Page 115 for list of equipment in each line

Worthington-Ransome Distributors

Ala., Birmingham, J. D. Pittman Tractor Company
Ala., Montgomery, Burford-Toothaker Tractor Co.
Alaska, Anchorage, Airport Mach. & Storage Co.
Cal., San Francisco, Coast Equip. Co.
Cal., Los Angeles Golden State Equip. Co.
Colo., Denver, Power Equipment Company
Conn., New Haven, Wilhelm-Davies Co., Inc.
Fla., Miami, Allied Equip., Inc.
Fla., Orlando, Highway Equip. & Supply Company; Tampa, Epperson & Company
Ga., Atlanta, Tractor & Machinery Company
Ida., Boise, Olson Manufacturing Company
Ill., Chicago, Chicago Construction Equipment Co.
Maine, Portland, Maine Truck-Tractor Company
Mass., Boston, Clark-Wilcox Co.
Mich., Muskegon, Lakeshore Machy. & Supply Co.
Mass., Allston, Boston, Clark-Wilcox Co.
Miss., Jackson, Jackson Road Equip. Co.
Mo., Clayton, The Howard Corporation
Montana, Billings, Interstate Truck & Equip. Co.; Helena, Caird Eng. Works.
N. M., Albuquerque, Bud Fisher Co.
N. Y., Albany, Milton-Hale Machinery Company; New York, Hodge & Hammond, Inc.
N. Y., Syracuse, Milton-Hale Mach. Co.
N. D., Fargo, Smith Commercial Body Works, Inc.
O., Cincinnati, Carroll Edwards Co.
Okla., Oklahoma City, Townsco Equip. Company
Ore., Portland, Andrews Equip. Service
S. C., Columbia, Smith Equipment Company
S. D. Rapid City, Phillippi Murphy Equip. Co.
Tenn., Knoxville, Dempster Bros., Inc.
Tenn., Nashville Dempster Bros., Inc.
Tex., Amarillo, T. W. Carpenter Equip. Co.
Texas, Dallas, Shaw Equip. Co.
Utah, Salt Lake City, J. K. Wheeler
Vt., Barre, A. M. Flanders, Inc.
Wash., Spokane, Andrews Equip. Service
Wisc., Milwaukee, Drott Tractor & Equip. Co. Inc.

Ransome Distributors

Ariz., Phoenix, Lee Redman Company
Ark., Little Rock, Kern-Limerick, Inc.
D. C., Washington, M. A. Doetsch Mach. Company
Ill., Chicago, Thomas Hoist Company
Ind., Fort Wayne, American Steel Supply Co.
Ky., Paducah, Henry A. Petter Supply Company
La., New Orleans, Ole K. Olson Company
Md., Baltimore, Stuart M. Christhilf & Company
Mich., Detroit T. G. Abrams
Mo., Kansas City, Brown-Strauss Corp.
Neb., Lincoln, Highway Equip. & Supply Co.
N. J., Newark, Johnson & Dealaman
N. C., Raleigh, Smith Equip. Company
O., Cleveland, H. B. Fuller Equip. Company
Pa., Philadelphia, Giles & Ransome Wilkinsburg, Arrow Supply Company
Tex., El Paso, Mine and Smelter Supply Company Houston, McCall Tractor & Equip. Company

Worthington Distributors

Ark., Fort Smith, R. A. Young & Son Little Rock, R. A. Young & Son
Ind., Indianapolis, Reid-Holcomb Company
Ky., Harlan, Hall Equipment Sales Company Louisville, Williams Tractor Company
La., New Orleans, Wm. F. Surgi Equip. Company
Md., Baltimore, D. C. Elphinstone, Inc.
Mass., Cambridge, Field Mach. Company
Mich., Detroit, W. H. Anderson Co., Inc. Flint, Gransden-Hall & Company
Mo., Kansas City, Mach. & Supplies Co.
N. J., Hillside, P. A. Drobach No. Bergen, American Air Compressor Corp.
N. M., Roswell, Smith Machinery Company
N. Y., Buffalo, Dow & Co., Inc. New York, Air Compressor Rental & Sales Olean, Freeborn Equip. Company
N. C., Raleigh, Carolina Tractor & Equip. Co.
O., Cleveland, Gibson-Stewart Company Marietta, Northwest Supply & Equip. Co. Toledo, The Kilcorse Mach. Co.
Oregon, Portland, Andrews Equip. Service
Pa., Allentown, H. N. Crowder, Jr., Inc. Easton, Sears & Bowers Harrisburg, American Equip. Corp. Oil City, Freeborn Equipment Company Pittsburgh, Atlas Equip. Corp.
Pa., Phil. Metalweld, Inc. Wilkes-Barre, Ensminger & Company
Texas, El Paso, Equip. Supply Company San Antonio, Patten Machinery Company
Va., Richmond, Highway Mach. & Supply Co.
Wash., Seattle, Star Machinery Company
Wyoming, Cheyenne, Wilson Equip. & Supply Co.

BUY BLUE BRUTES

Worthington Pump and Machinery Corp.

Worthington-Ransome Construction Equipment Division

Holyoke, Massachusetts

HI-UP... IN NAME, REPUTATION AND QUALITY

Flexibility, engineered into all Ransome Blue Brute Truck Mixers, reaches its peak in the new Hi-Up. This flexibility eliminates all strains resulting from misalignment while charging, discharging, or operating over uneven ground. The truck mixer is designed so that when discharging is completed, all moving parts return to their normal positions.

The transmission shows a marked advance over usual design. Enclosed water pump clutch requires no adjustment and at no time is there any need for manual lubrication. A separate engine clutch, two speeds forward and reverse, and multiple disc clutches assure easier starting, a wider performance range and smoother operation.

Other new design details: Unbreakable, anti-freeze gauge glasses, in full view of the operator . . . Quick-charging, unobstructed hopper, with improved sealing door, prevents jamming . . . Positively leak-proof poppet valves with renewable discs — found only in Ransome Truck Mixers . . . Exclusive mixing drum design, with new type spiral blades, for quick charging and fast, clean discharging.

These are but a few of the reasons why the Blue Brute Hi-Up is setting a new high in truck mixer performance — and offering time-saving, trouble-free production of better concrete at lower cost.

Get the whole story from your nearby Worthington-Ransome dealer, or write for Bulletin No. 221.

R6-7

KNOW YOUR BLUE BRUTES

Your Blue Brute Distributor will gladly show you how Worthington-Ransome Blue Brute Hi-Up Truck Mixers and other construction equipment can put your planning on a profitable basis — and prove that *there's more worth in Worthington*. His name is listed on Page 114, Blue Brutes include:

RANSOME EQUIPMENT

Pavers, Concrete Spreaders and Finishers*, Portable and Stationary Mixers, Pneumatic Placing Equipment, Truck Mixers, Plaster & Bituminous Mixers and Accessories.

WORTHINGTON EQUIPMENT

Gasoline and Diesel Driven Portable Compressors, Rock Drills, Air Tools, Contractors' Pumps* and Accessories.

*To be announced.

BUY BLUE BRUTES

Truck Mixers
Capacities:
2, 3, 4½ cu. yds.

Portable Mixers
Capacities:
3½, 6, 11, 16, 28 cu. ft.

Big Stationary Mixers
Capacities:
28, 56, 84, 126 cu. ft.

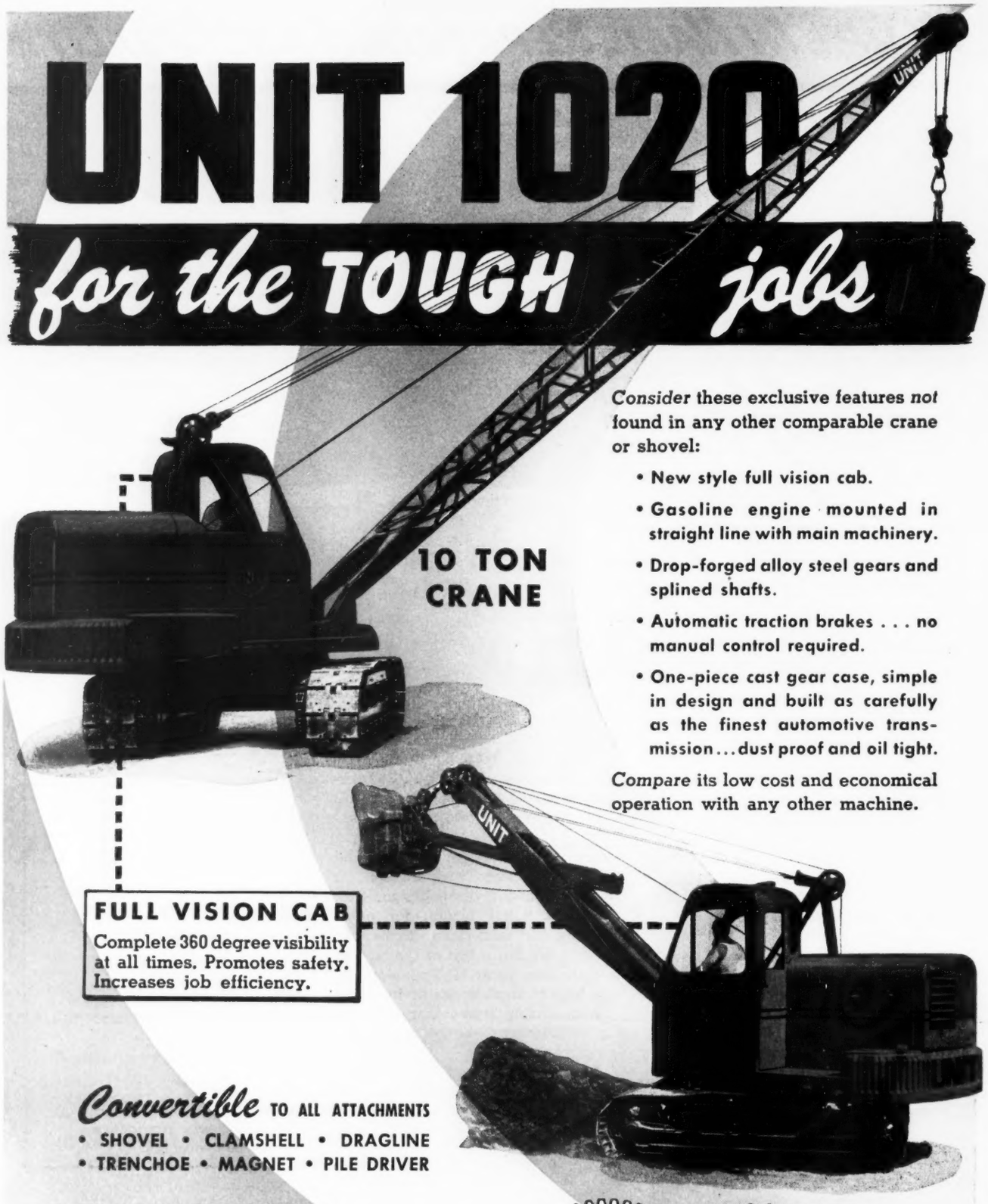
Pneumatic Placer
Capacity:
7, 14, 28 cu. ft.

WORTHINGTON

Worthington Pump and Machinery Corporation, Worthington-Ransome Construction Equipment Division, Holyoke, Mass.

UNIT 1020

for the TOUGH *jobs*



10 TON CRANE

Consider these exclusive features *not* found in any other comparable crane or shovel:

- New style full vision cab.
- Gasoline engine mounted in straight line with main machinery.
- Drop-forged alloy steel gears and splined shafts.
- Automatic traction brakes . . . no manual control required.
- One-piece cast gear case, simple in design and built as carefully as the finest automotive transmission . . . dust proof and oil tight.

Compare its low cost and economical operation with any other machine.

FULL VISION CAB
Complete 360 degree visibility at all times. Promotes safety. Increases job efficiency.

Convertible **TO ALL ATTACHMENTS**
• SHOVEL • CLAMSHELL • DRAGLINE
• TRENCHOE • MAGNET • PILE DRIVER

CONTACT FACTORY DIRECT
FOR PRICE AND DELIVERY

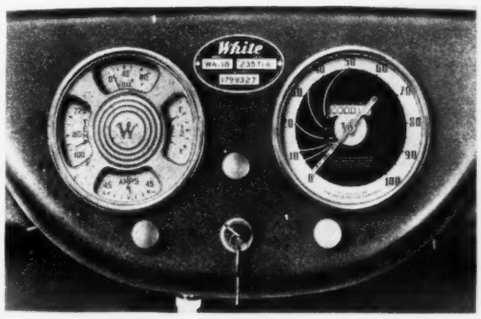
¾ YARD SHOVEL

UNIT CRANE & SHOVEL CORP. MILWAUKEE WISCONSIN

UNIT CRANE & SHOVEL CORP. **MILWAUKEE 14, WISCONSIN, U.S.A.**

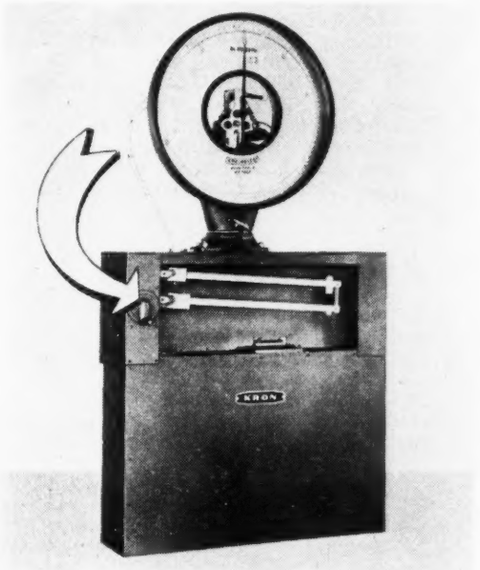
A4848-1PC-R2

ECONOMY RANGE FINDER combines features of ordinary speedometer with those of tachometer and adds instructions governing various engine speeds. It helps drivers in shifting gears, saving fuel, conserving trucks, and making schedules. Spiral white line for each transmission gear appears on dial and is combined with scale of rpm. printed on speedometer pointer. As speedometer pointer



moves around dial, edge of pointer crosses line for each gear. White area on pointer indicates ideal operating range from 1,700 to 2,400 rpm. and at either end is red area which indicates when engine is operating outside proper range. When pointer crosses white line at outer end, it indicates that recommended maximum rpm. has been reached and driver should shift into next higher gear. When it crosses white line at inner end, it suggests shift into next lower gear. Result is cleaner combustion, greater gasoline mileage, better lubrication and cooling, and longer engine life.—**White Motor Co., 842 E. 79th St., Cleveland 3, Ohio.**

UNIT WEIGHT CABINET features high-gross weighing capacity scale with low and accurate "fractional" weight dial chart graduations. Scale is equipped with standard Kron dial mechanism, swivel head, tare and capacity beams and drop weights to provide exceptional gross platform capacity. By rotating handle on left of cabinet front, from 1 to 7 unit weight increments, each

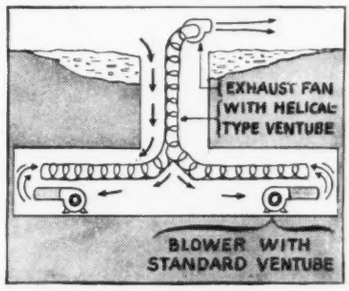


equivalent to dial chart capacity, can be added to lever system to increase gross weighing capacity as much as nine times for heavy-duty service. Weight increments are indicated in target on dial chart as they are added to lever system. Flexible cables connecting this target to drop weight mechanism allow dial head to swivel to any desired position.—**The Yale & Towne Mfg. Co., Philadelphia Division, Philadelphia 24, Pa.**

YOUR VENTILATING PROBLEM SOLVED FASTER with FLEXIBLE "VENTUBE"*

Quick coupling speeds installation of "Ventube." One man can set up 100 feet in an hour—a speed that cannot be approached when installing rigid ducts.

Light in weight—"Ventube" can be swiftly taken down and carried to another job, or stored for later use. One man can carry 100 feet.



Fresh air sweeps breast clear of dust and carbon monoxide speedily. Combinations of standard "Ventube" with blower, and Helical-type with exhaust fan, solve any ventilating problem

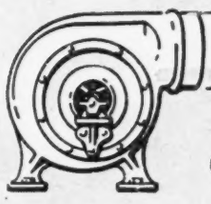
The outstanding advantage "Ventube" offers you in tunnel construction work is its extreme ease of handling. Du Pont's flexible, synthetic-rubberized ventilating duct can be easily adapted to deliver a large volume of fresh air at the heading under all tunneling conditions.

"Ventube" is light. It can be carried to the job, suspended, coupled, and put into operation with a speed that cannot be approached when installing rigid conduit. "Ventube" can be rolled compactly for storage. Its flexibility takes it around curves, up and down slopes, with a minimum of special fittings. A wide range of lengths and diameters is available to fit any need. And the cost of "Ventube" is low.

A natural partner for standard "Ventube" is non-collapsible Helical-type "Ventube," ideal for use with exhaust fans. Made with a tempered steel inner spring, it can be bent at any angle—even doubled back on itself—without appreciable loss of airflow. And Helical-type "Ventube" is easy to handle and store. It accordion-folds at a ratio of 15 *feet* to 20 *inches*. Like standard "Ventube," it stands up ruggedly under rough wear and abrasion.

How many ways can "Ventube" speed work, cut costs for you? Probably in many! Consult Du Pont Technical Service now. Write E. I. du Pont de Nemours & Co. (Inc.), Fabrics Division, Fairfield, Conn.

*"VENTUBE" *is Du Pont's registered trade mark for its flexible, synthetic-rubberized ventilating duct.*



DU PONT "VENTUBE"

REDUCING COSTS THROUGH BETTER VENTILATION

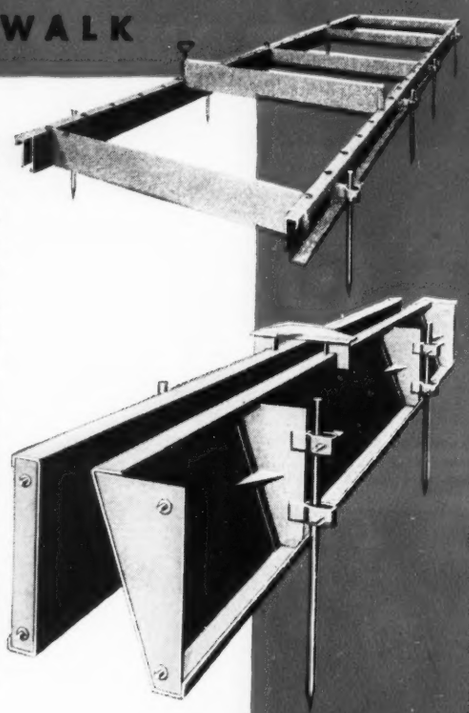
DU PONT

BETTER THINGS FOR BETTER LIVING ... THROUGH CHEMISTRY

HOW TO

improve appearance and save money

ON CONCRETE CURB, GUTTER AND SIDEWALK



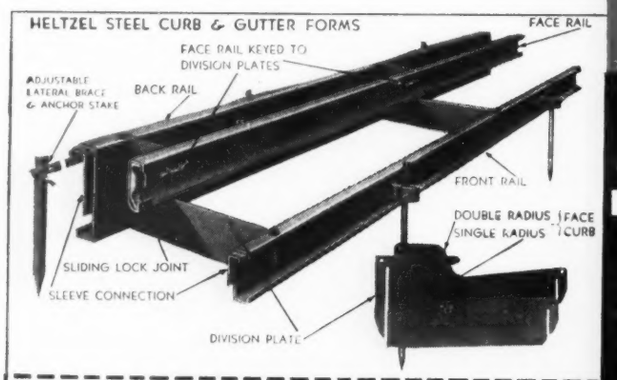
You buy Heltzel Steel Forms once. They stay in service for 20 years or more and each job you set is as uniform as the ones before. The low cost of the equipment per year of service plus the benefits of faster work with the use of forms net substantial savings.

Rigid, self-interlocking Heltzel Steel Forms make the setting and stripping job much easier and faster. No warping, no chipping, no replacements.

Heltzel has been engineering steel forms for 36 years. No matter how complicated or individual your specifications, we can furnish forms for your work.

Purchase of Heltzel Steel Forms for municipal sidewalks, gutters, and curbs enables cities and towns to establish a sound employment program. No other method for setting concrete offers so many advantages.

Write today for engineering data Bulletin A-20-F on Heltzel Steel Forms.



Send me catalog A-20-F
"Steel Forms for Building Concrete Curbs, Curb and Gutters, or Sidewalks"

Name_____

Address_____

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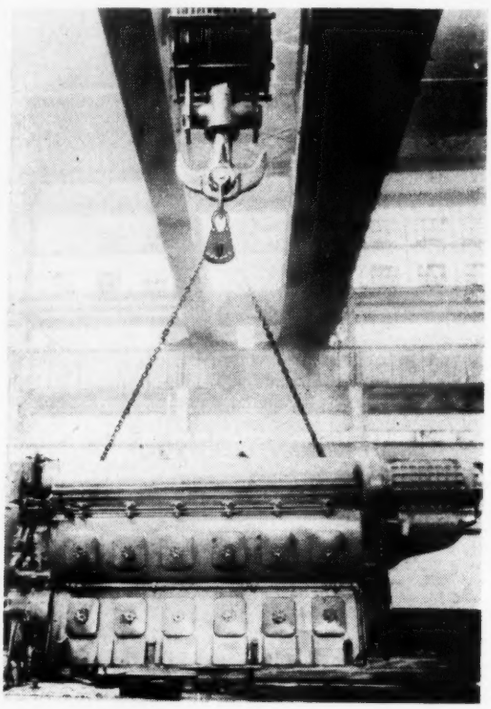
(Type of construction usually engaged in)

Heltzel BUILDS IT BETTER

- BINS, Portable and Stationary
- CEMENT BINS, Portable and Stationary
- CENTRAL MIXING PLANTS
- BATCHERS (for batch trucks or truck mixers with automatic dial or beam scale)
- BITUMINOUS PAVING FORMS
- ROAD FORMS (with lip curb and integral curb attachments)
- CURB FORMS
- CURB AND GUTTER FORMS
- SIDEWALK FORMS
- SEWER AND TUNNEL FORMS
- CONCRETE BUCKETS
- SUBGRADE TESTERS
- SUBGRADE PLANERS
- TOOL BOXES
- FINISHING TOOLS FOR CONCRETE ROADS

HELTZEL STEEL FORM & IRON CO. WARREN, OHIO · U. S. A.

AUTOMATIC-EQUALIZING CHAIN SLING, known as "Safe-T-Lift," and made in 4-, 7-, 14-, 25-, and 40-ton capacities, is claimed to be indispensable in operation of foundries, steel mills, railroad shops and other like industries. Block or chain equalizer unit is placed on crane hook and operator spots hook over approximate center of gravity of load. Floormen then attach sling's chain legs to load. Power is next applied by operator and as crane hook rises, sling's chain automatically



adjusts itself through equalizing unit which consists of sturdy steel block and floating sheave specially constructed to fit steel alloy chain. When loads are lifted, one chain leg becomes longer than other and as weight of load pulls on chain, sheave in equalizing unit pulls down against brake, preventing slippage. Level lifting of load is thus assured. If crane operator does not get crane hook and equalizing unit close enough to load's center of gravity, load is lowered enough to relieve tension on sling and release brake. Crane hook then is moved over to true center of gravity, and when power is applied, chain readjusts for level lifting.—**Hercules Sling Co., Rockford, Ill.**

SKIN-PROTECTOR COMPOUND protects against sore, broken irritated skin from drying of cement, concrete, clay plaster and other materials which crack skin and permit infections to form. Sealskin is composed of innocuous waxes and oils and one application lasts through entire working day. Forms durable, invisible, waterproof coating, unaffected by most acids or alkalis. Comes packed in 6- and 20-oz. jars and in 1- and 6-gal. drums.—**Cadet Laboratories, Worcester 5, Mass.**

WATERPROOF FABRIC CEMENT is developed for cementing imitation leather or similar products to plaster, wallboards, wood, or metal surfaces to obtain solid, permanent adhesion. It is easily applied with brush to fabric and is sufficiently slow in setting to allow ample time for adjustment and fitting of fabrics to surfaces. Does not contain any ingredients that will cause shrinking of fabric and thus allows close butting of joints. Paleness in color eliminates stain and smudge. Any cement on surface of fabric can be easily removed by wiping with naphtha-saturated cloth. — **Dolphin Paint & Varnish Co., 922 Champlain St., Toledo 3, Ohio.**

"Mileage means *money* to us!"

M. L. ADLEY, Treas.
Adley Express Co.
New Haven, Conn.

● "Our East Coast operation of 400 highway carriers traveling over 500,000 miles per month and hauling some 12 million pounds per week, requires careful estimating and cost accounting. For the past 25 years our records proved Armstrong Tires are economical and dependable. I am now looking forward to an even better Armstrong Tire to aid us in reducing operating costs . . . mileage means money to us."

SINCE 1912 hundreds of commercial car operators have learned that *you can't buy a better tire than an Armstrong!* For years, we have pioneered in making tires that wear longer and cost less. You can count on an Armstrong to give you a tire that will perform better, last longer, stand up under all conditions and cost you less per mile of use! That's not a statement—it's a promise, a promise backed by the thirty-year integrity of the manufacturer.

For literature or information write your Armstrong distributor or to Armstrong Rubber Company.

ARMSTRONG TIRES

Manufacturers of Quality Tires and Tubes Since 1912 · General Offices and Plant—460 Elm Street, West Haven 16, Conn.

MEMO TO ALL CONSTRUCTION SUPTS.
For Bigger Payload Performance
...the logical first choice is HAISS HI-POWER. Unique for Sta-in-line reeving, out-of-the-muck sheaving. Weight placed for highest digging power, with closing ratios up to 7:1. Write for facts.
HAISS
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Distributors in all large cities

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INVESTIGATE NOW!

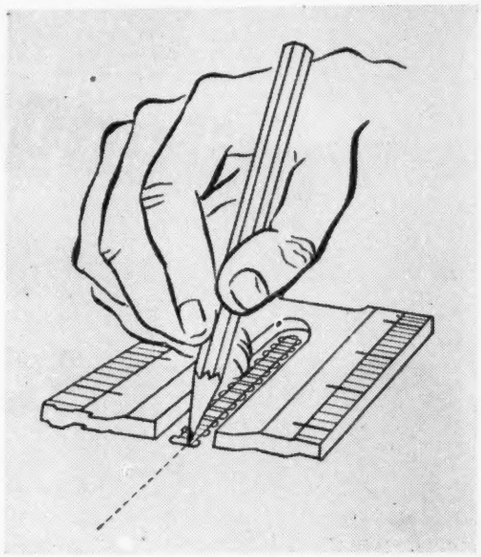
Caine CAN-PLATE Steel Piling

STRONGEST Per POUND WEIGHT

Used the world over for building Foundations, Dams, Retaining Walls, Docks, Levees, Bulkheads, Sewers, Disposal Plants and thousands of other construction jobs.

CAINE STEEL COMPANY
STEEL PILING DIVISION
1820 N. Central Avenue **Chicago 39, Illinois**

NEW DRAWING DEVICE furnishes draftsmen with accurately dotted lines in split second. Made of transparent plastic in two sizes for pocket and



desk, Spee-Dotter is fully graduated for ruling and measuring. It can be used to make parallel lines and for measuring also.—**C-Thru Ruler Co., Hartford, Conn.**

OVERHEAD GUARDS protect lift truck operators from falling objects. Constructed of rugged steel tubing and easily installed, guards come in two standard sizes. They extend in front of, over, and behind operator. Transverse lengths of 1½-in. steel tubing in front and above are notched and

arc-welded to side members of frame. Back sections of side frame members are made of 1½-in. standard black steel tubing, while front sections, which telescope over back sections, are 2 in. in diameter. Can be installed in 10 or 15 min. by bolts and clamps which are furnished. No cutting or drilling of frame is necessary.—**Towmotor Corp., Cleveland, Ohio.**

SALT TABLET DISPENSER of high-pressure molded reinforced bakelite is highly resistant to fracture. It is corrosion- and moisture-proof. Featuring easy one-hand operation, it provides one tablet at time with each fractional turn of knob. Capacity is 1,500 tablets. Quick-dissolving standard 10-grain sodium chloride and dextrose tablets are available for use in dispenser.—**Mine Safety Appliance Co., Braddock, Thomas and Meade Sts., Pittsburgh 8, Pa.**

● Once again world-famous Marmon-Herrington *All-Wheel-Drive* Trucks are available for commercial purposes—ready to make all trucking jobs easy—regardless of the most unfavorable and difficult operating conditions.

Marmon-Herrington *All-Wheel-Drive* Trucks for 1946 are improved throughout—more rugged, more powerful, more efficient. Important features include: 4-wheel or 6-wheel drive—greater approach angle—low center of gravity—wide range of gear ratios—easy-action steering—powerful air brakes—rated gross capacities up to 42,000 lbs.—and many other advantages.

Here are trucks designed to do everything that conventional-drive trucks can do—*and more!* With *live* power and traction in *every* wheel—front wheels pulling, rear pushing—Marmon-Herrington Trucks conquer deepest mud, sand and snow, steepest hills and mountain grades . . . and do it with amazing, sure-footed ease!

For full information on these new Heavy-Duty *All-Wheel-Drive* Trucks, or Marmon-Herrington *All-Wheel-Drive* converted Fords, see your near-by Marmon-Herrington dealer, or write us direct.

MARMON-HERRINGTON CO., INC. • INDIANAPOLIS 7, INDIANA

Road Building and Maintenance

Great power and traction for moving heavy loads through mud, dirt, sand, gravel. Available with underbody blades for grading, etc.

Snow Removal

Sure-footed *All-Wheel-Drive* tractive power assures fast, efficient removal of heaviest snow. Adapted to either blade or rotary plows.

Oil Field Service

Unexcelled for transporting oil machinery and equipment, including derricks and pipe, to and from locations—regardless of terrain.

Public Utility Service

Ideal for both on- and off-the-road operations. Available with winches, derricks, earth borers, etc., for every type of public utility construction and maintenance work.

Logging, Mining, etc.

Rugged strength and *All-Wheel-Drive* power combine to handle the back-breaking loads these operations demand, both on the road and off.

MARMON-HERRINGTON *All-Wheel-Drive Trucks*

★

Announcement

★

Electroline FIEGE WIRE ROPE Connectors ARE NOW AVAILABLE THRU MILL SUPPLY Distributors

★

all types FOR ANY WIRE ROPE JOB

★

Ask your REGULAR SUPPLIER *about* *Electroline* FIEGE Connectors *Today*

★

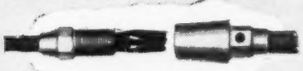
Goes on in no time—hangs on for all time

this

Electroline FIEGE WIRE ROPE CONNECTOR

See how easily it goes on—simply slide the sleeve on the cable, spread the strands

insert and drive in the plug and apply the socket



Then see what a solid and permanent joint you have by looking at it through the inspection hole put there for the purpose

There's a Type for Every Need

CLEVIS

EYE-END

STUD END

COUPLING

OPEN TYPE TURNBUCKLE

TURNBUCKLE

DOUBLE CONNECTOR TURNBUCKLE

This better connector damps vibration, prolongs wire rope life; is in fact the STRONGEST PART of a wire rope assembly. Ease and low cost of installation, and lifetime service, have made it the first choice for performance and value—wherever wire ropes, cables and strands are used.

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Electroline Company

4121 SOUTH LA SALLE STREET, CHICAGO, ILLINOIS

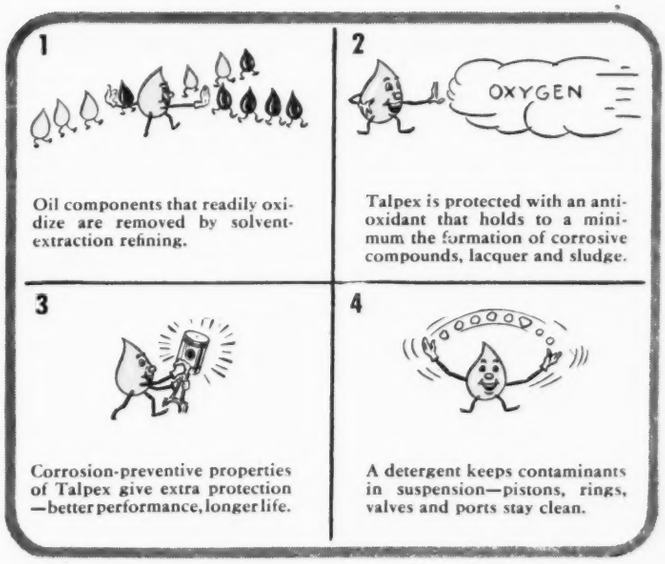
FLOOR SCRUBBING AND POLISHING MACHINE is available in four models in 12-, 14-, 16- and 19-in. sizes, providing an efficient unit for every kind of floor maintenance and performing scrubbing, buffing, waxing, polishing, sanding, grinding, troweling, dry cleaning and shampooing operations with minimum of time and effort. Features: (1) one simple control allows handle to be raised or lowered, eliminating strain; (2) flip of operator's finger stops or starts either motor or flow

without necessity of moving hands from working position; (3) motorcycle-type handles prevent hands from slipping; (4) touch of thumb locks motor control and flip of finger releases it; (5) heavy-duty-type wheels with 1 in. tread, metal bushings, plated hub nuts and extra heavy axle to prevent spreading; (6) GE capacitor motor needs no brush replacements, runs cooler and uses less electricity; (7) motor and gears inclosed in separate housings to simplify repairs; (8) tubular rubber bumper, 1 in. wide, protects brush housing from damage and baseboards from being marred.—**M & C Maintenance Co., 2277 Ford Parkway, St. Paul, Minn.**

ELECTRIC MARKER for engraving permanently sizes, numbers, names and other important information on iron, steel, bronze and aluminum tools and other products uses entirely new principle of design increasing power of cutting stroke 30 percent over previous models. All parts inclosed and

ready for use. For average marking a hardened alloy point is furnished. For marking extra hard materials, a diamond point is recommended.—**Ideal Commutator Dresser Co., 4102 Park Ave., Syracuse, Ill.**

THESE FOUR *TALPEX* PERFORMANCE FACTORS SAFEGUARD HIGH-SPEED DIESELS


1
Oil components that readily oxidize are removed by solvent-extraction refining.
2
OXYGEN
Talpex is protected with an anti-oxidant that holds to a minimum the formation of corrosive compounds, lacquer and sludge.
3
Corrosion-preventive properties of Talpex give extra protection —better performance, longer life.
4
A detergent keeps contaminants in suspension—pistons, rings, valves and ports stay clean.

OF COURSE, you know that no oil will last forever in a Diesel. But do you know that Old Man Oxygen, after years of easy wins over ordinary oils, gets the surprise of his life with Shell Talpex?

That's because Talpex is doubly protected against oxidation to retard the formation of corrosive compounds, sludge and lacquer.

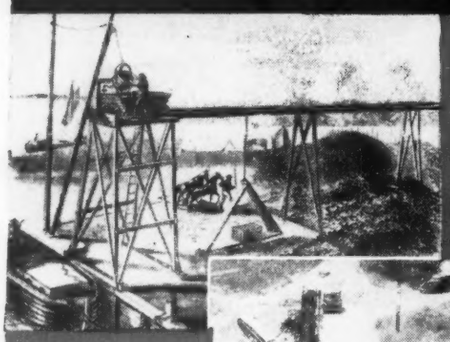
If the oil you are now using hasn't been doubly protected against oxidation—if it doesn't have special corrosion-preventive properties—if it doesn't have detergent properties—then you had better change to Shell Talpex. Long after an ordinary oil "gives up," Talpex keeps on giving safe lubrication to your Diesel.

The Shell Lubrication Engineer will give you sound advice about the lubrication of *any* type of Diesel, whether slow, medium, or high speed. Write for a copy of Shell's booklet, "The Fundamentals of Diesel Lubrication." Shell Oil Company, Incorporated, 50 West 50th St., New York 20, N. Y., or 100 Bush St., San Francisco 6, California.

SHELL

SHELL DIESEL LUBRICANTS

Thermoid —For Progress in American Industry



← *Bulk Materials Handling in 1872.* Getting coal from barge to coal yard involved tedious hand shoveling, team and teamster, derrick, pulleys, tracks, counterweights and a great deal of time.

from the Bettman Archive

→ *Modern Methods with Thermoid.* Sand, gravel, crushed stone, coal—any kind of bulk material is speedily and effortlessly moved from pit, mine, ship or storage with loading machinery equipped with durable Thermoid belting.

IN most large-scale production plants mechanical transportation of materials in process is replacing costly, cumbersome, laborious manual methods. The result: greater production, better working conditions, fewer accidents, reduced costs.

In outdoor extractive industries and in factories, Thermoid has contributed to this progress through the development of conveyor belting to meet the special requirements of different companies. Consultation with a Thermoid representative may develop ways to help you improve processes and reduce costs.

Since 1880, in problems involving hose, belting and friction materials, industrialists have found *it's good business to do business with Thermoid.*

THE THERMOID LINE INCLUDES: Transmission Belting • V-Belts and Drives • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Sheet Packings • Industrial Brake Linings and Friction Products • Molded Hard Rubber and Plastic Products.

Thermoid Rubber

DIVISION OF THERMOID COMPANY

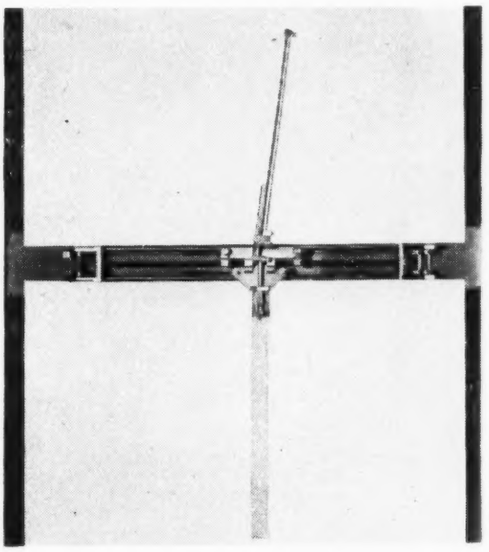
TRENTON 6, NEW JERSEY

Contributor to Industrial Advancement Since 1880

ONE-MAN OPERATED CARGO-CRANE has lifting capacity of 2,900 lb. at 15-ft. radius and up to 15,000 lb. at 3½-ft. radius. Boom swings in full 210 deg, with short turning radius of chassis. Wheel base of 10 ft. 9 in. permits fast work in narrow spaces. Steering is accomplished by dual wheels operating on pivoted axle. Entire unit is

operated by three-speed transmission from 57-hp. gas engine for traveling, swinging, hoisting and boom hoist. Has three traveling speeds forward and one reverse, with low speed of 1.9 mph. and high of 6.75 mph. Boom is of gooseneck type, 20 ft. long, and can be furnished in one piece or telescopic.—**Link-Belt Speeder Corp., 307 N. Michigan Ave., Chicago, Ill.**

STEREOGRAPH PERSPECTIVE DRAWING MACHINE produces a perspective view as stereoscopic pairs showing length, width and depth, or if desired, as a single perspective drawing and reduces substantially time and cost in making perspectives. Eliminates use of gadgets or ordinary equipment of drawing board to find vanishing

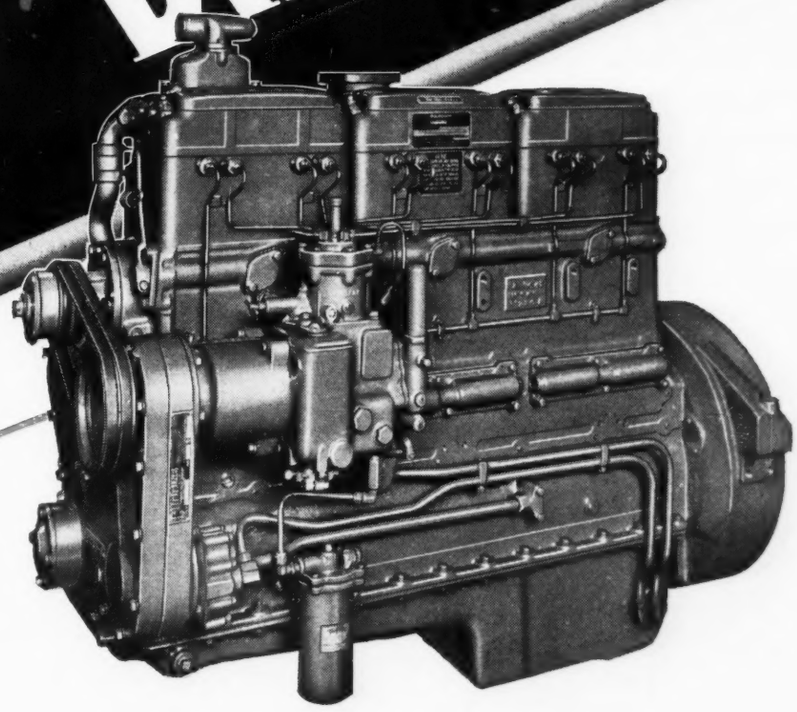


points. Also valuable for solving problems in geometry. Produces third dimensional graphs, creates space curves and through its three dimensional effects, shows the internal construction of highly complex mechanisms. Instrument is made of duraluminum with high carbon steel for guides and rotating members. Length 32 in.; width 3¼ in. At top is hair-line point finder 20 in. long and at bottom is drawing straight-edge 20 in. long for making perspective drawings.—**Pomeroy Stereograph Co., Inc., 1783 E. 11th St., Cleveland, Ohio.**

Assure Faster Round Trips

with

CUMMINS *Dependable* DIESELS



CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA

'TOURNAPULLS MOVED MORE than any other

Comparative study made on 250,000 cu. yd. Queens Lane Reservoir job in Philadelphia proved to Augustine Construction Company the ability of Tournapulls to double the production of its crawler-drawn scrapers on short 300 to 600′ hauls in tough materials and adverse operating conditions. Here's what Sal Augustine has to say about it:

"Job consisted of approximately 250,000 cubic yards of dirt, mica schist, clay, sand and rooted rock. All of the job was in reverse operation from normal cut and fill, loading down in the pit and hauling uphill to make fill for a dike approximately 50′ high. Adverse grades ran to 17%. Operations continued through snow, rain, sleet, freezing weather, frost . . . material was frozen in the mornings, damp and slippery around noon.

"Our Tournapulls worked right through it all . . . moved more yardage on hauls as short as 300′ than any other piece of dirtmoving equipment on the job."

Each Tournapull Averaged 1500 Pay Yards Per 8-Hour Day on 600′ 1-Way Haul

A time study made in January showed each Tournapull averaged 17 loads per hour on a 600′ 1-way haul. This was double the production of crawler-drawn scrapers working on the same cycle . . . in the same tough materials, grades and working conditions.

No Tournapull Delays

Started in late November, this all-winter job was scheduled for completion in March. Because of the Tournapulls' production capacity and ability to keep working without breakdown or repairs, the job was actually finished in early February, ahead of schedule.

Increase YOUR Profits with Tournapulls

Actual case histories like this prove that Tournapulls are delivering lowest-net-cost-per-yard on all types of jobs . . . on all lengths of hauls . . . under all operating conditions. They will do the same for you. Ask your LeTourneau Distributor for facts and figures TODAY.

C46

YARDAGE ON SHORT HAULS

piece of equipment on job"

says Augustine Construction Company

ast, positive ejection saved time on e fill . . . controlled spreading built excellent shoulders . . . Tournapulls ad no trouble operating close to edge embankment.

urnapulls were snatch loaded to apacity in 55 to 60 seconds. A Le-urneau Rooter was used to break up aterial for fast loading.

orrect ratio of weight to horsepower ave fast acceleration, enabled Tour-apulls to make a 1200' round trip very 3.5 minutes.

ll dirt was moved uphill from center reservoir to build 50' dike enclosure. rades ran as high as 17%, often ere wet, frosty and slippery.

E TOURNEAU

PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

JOB-PROVED Over 4300 Built and Shipped

TOURNAPULLS*

* Trade Mark Reg. U.S. Pat. Off.

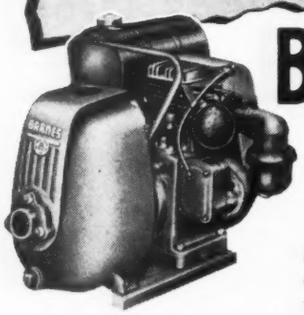
Here's Real Economy!

PUMP 4⅛ TANK CARS ON 1 GALLON OF GAS . . .

with

Barnes Automatics

The "33,000 for 1" Pump



THE "STREAK" 2-In. BARNES PUMP

NO WAITING! NO DELAY!

Stock Shipment on This Pump!

Not 1000! Not 10,000! But 33,000 gallons! 33,000 gallons of water pumped for 1 gallon of gas! This is an amazing ratio. This is equivalent to 4⅛ railroad tank cars. This is real economy. And it's yours when you use Barnes Automatic Self-Priming Centrifugals.

Where intermittent pumping of large volumes of liquids is required—where the utmost in portability is desired—where a rugged, tough, and able-to-take-it pump is needed—these new *Barnes "33,000 for 1" Pumps are the best buy on the market.*

ATTENTION DISTRIBUTORS!
A number of territories are still available.
Write, wire or phone!

BARNES MANUFACTURING CO.
Quality Pump Manufacturers for 50 Years — MANSFIELD, OHIO

ETNYRE

"Black-Topper"

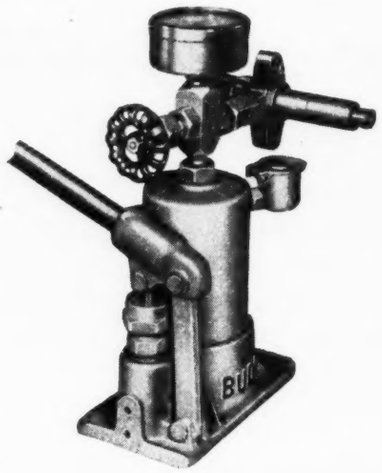
BITUMINOUS DISTRIBUTORS

for DEPENDABILITY

Over 40 years of research accentuated by numerous Army contracts . . . quality construction methods and materials . . . assure top-notch dependable performance with Etnyre Black-Toppers. Get full details from your Etnyre dealer or write direct.

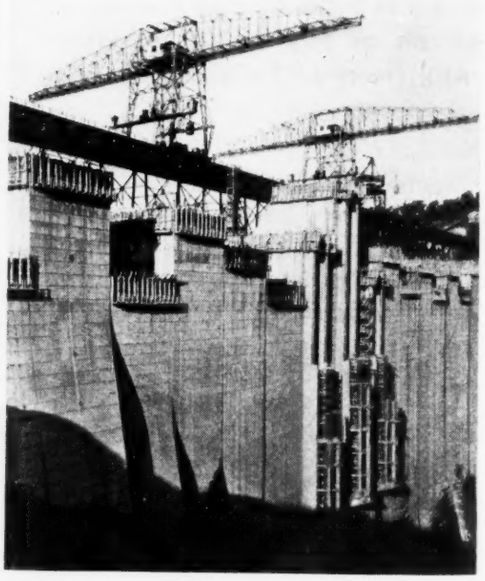
E. D. ETNYRE & CO., Oregon, Illinois

PORTABLE NOZZLE TESTER, designed for use with all makes of diesel engines, requires no technical knowledge for operation and can be handled by any mechanic or diesel operator. Measures injector opening pressures, determines accurate adjustment, checks spray pattern for uniformity and detects irregularities such as sticking needle



valves, dribble and leakage around valve seats. Tester is equipped with a standard hydraulic pressure gage, 3 11/16-in. dial, 3,000 psi. capacity and 100-lb. gradations. Gages of 5,000 and 7,500 capacity also are available. Completely portable tester weighs less than 19½ lb., including all steel carrying case, one adaptor and removable 12-in. steel handle.—**The Buda Co., Harvey, Ill.**

HOIST DRIVE FOR CRANES, known as Maxspeed system, automatically measures load so it is hoisted and lowered at maximum safe speed yet prevents handling of dangerous overloads. Is designed for use on indoor overhead, slow-speed cranes or outdoor high-speed cranes. Operates from ac. or dc. incoming power. Heavy loads are hoisted and



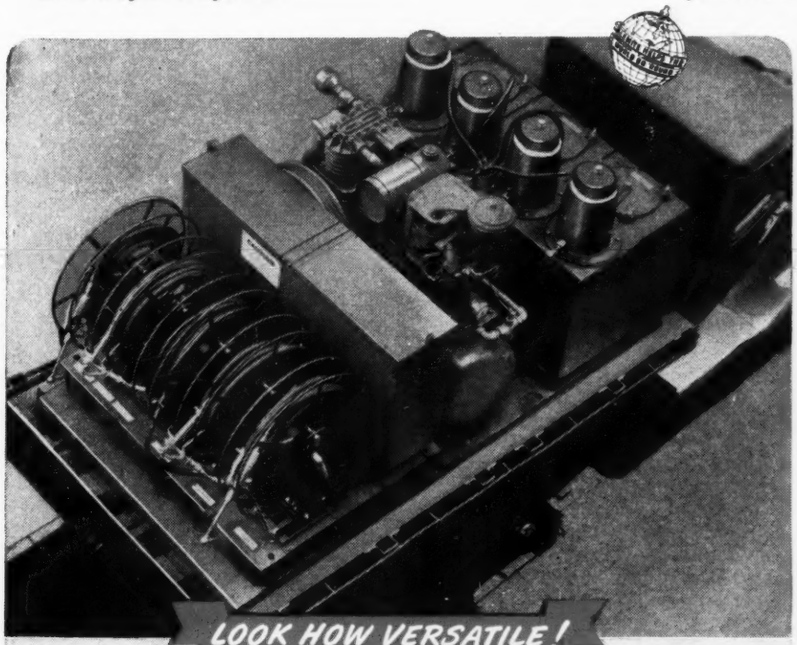
lowered at slow speeds and light loads or empty hook at high speeds. Intermediate loads are handled at intermediate speeds, depending on weight of load. Speed changes are inherent in drive and do not depend on functioning of control devices. Braking is accomplished electrically and power is returned to supply system instead of being dissipated in resistors. Solenoid brake holds load when at rest.—**General Electric Co., Schenectady, N. Y.**

Q Are you all set today for the jobs immediately ahead?

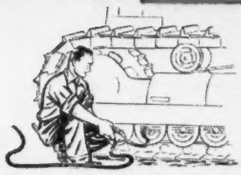
A If you're not—you should be! Make sure *now* that your machines will have less "down time," cost less to maintain, yet produce more work. For example: one contractor cut track roller and other bearing failure 25%—saved up to 20% on lubricants by switching to Alemite "on the job" power lubrication. "Down time" saved became *extra* productive time. An Alemite Portable Service Station can help you meet tomorrow's tougher competition!

Q Is "on the job" lubrication costly?

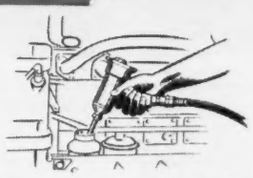
A On the contrary—an Alemite Portable Service Station pays for itself by saving money! Take the case of the contractor who was losing money on 5 machines because of slow lubrication methods. A Portable Service Station brought power lubrication *to* the machines . . . cut lubricating time 50% . . . gave him an hour and forty minutes More Productive Time *per day!* The savings in maintenance, machines and time soon paid for the new method.



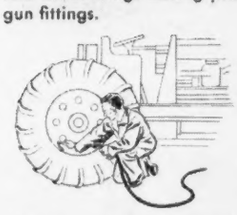
LOOK HOW VERSATILE!



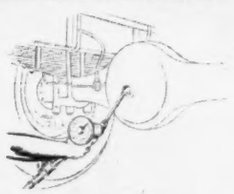
Fast, easy lubrication of track rolls and all bearings having pressure gun fittings.



No time or oil wasted in filling crank cases, or other oil containers, with the amounts desired.



Air line equipment for tire inflation, air jet cleanings, engine cleaning, paint spraying, etc.



Quick and precise dispensing of gear lubricants to gear housings, transmissions, final drives, etc.

Save Time, Money and Machines with an Alemite Portable Station!

1. It saves time by bringing *positive* power lubrication *to* your machines. They need not leave the job.
2. It saves money by cutting "down time"... increasing productive time.
3. It saves machines . . . makes them last longer . . . by reducing bearing failure due to faulty lubrication.

Alemite Portable Service Stations come complete with high and low pressure barrel pumps, oil dispenser, hose reels and gas engine air compressor. The time, money and machines you save can be of tremendous help in showing additional profit on contracts.

FREE: Illustrated catalog describing Alemite Portable Service Stations. Also, complete Catalog of individual Alemite lubricating equipment. Send coupon for your copies.

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ALEMITE

And *Only* ALEMITE Combines ALL 3 In Lubrication

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Company .....
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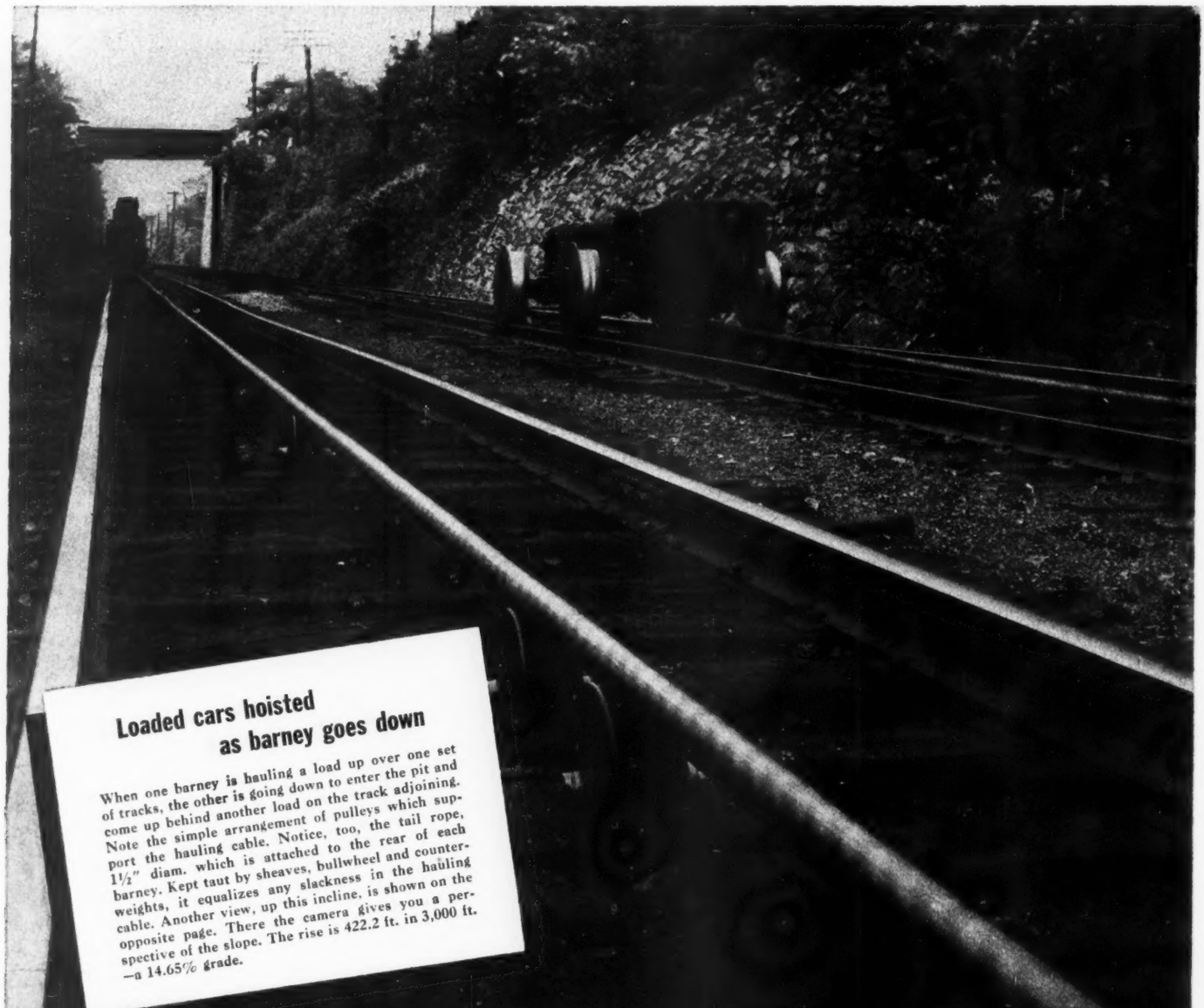
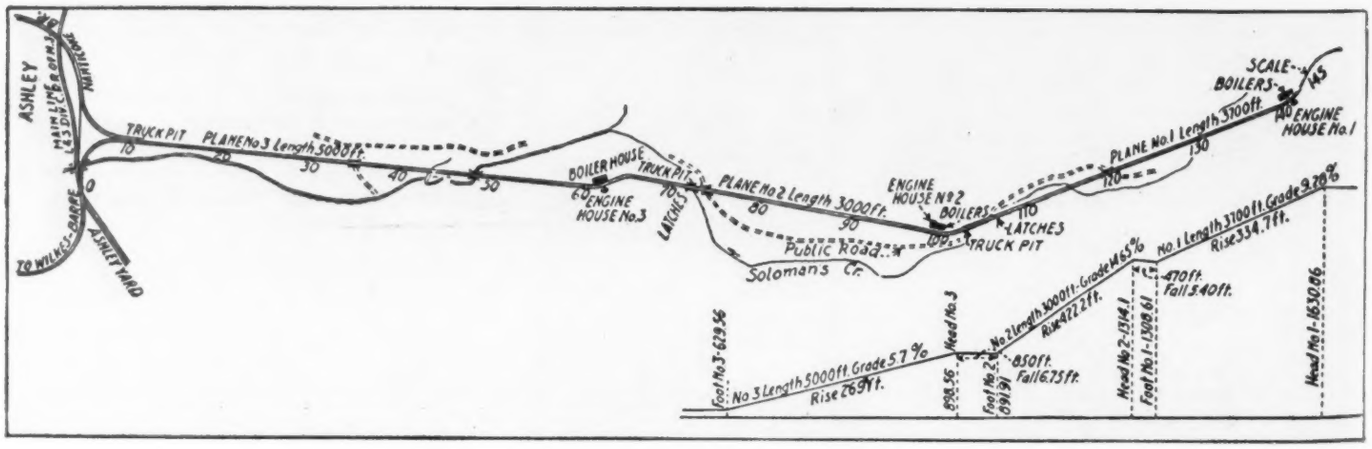
Hauling 27,972,495 tons of freight



Loaded cars hoisted as barney goes down

When one barney is hauling a load up over one set of tracks, the other is going down to enter the pit and come up behind another load on the track adjoining. Note the simple arrangement of pulleys which support the hauling cable. Notice, too, the tail rope, 1½" diam. which is attached to the rear of each barney. Kept taut by sheaves, bullwheel and counterweights, it equalizes any slackness in the hauling cable. Another view, up this incline, is shown on the opposite page. There the camera gives you a perspective of the slope. The rise is 422.2 ft. in 3,000 ft. —a 14.65% grade.



over the famous Ashley Planes

AMERICAN EXCELLAY PREFORMED TIGER BRAND Wire Rope sets records for top performance over 100 year period

WILKES-BARRE in the heart of the Anthracite field is three miles from Ashley, Pa., where the Ashley Planes are located. From Ashley to the mountain top it is 1,000 feet up. The grade of the famous Ashley Planes is such that a locomotive cannot negotiate it economically. The alternate route around the mountain is 12.41 winding miles of heavy grade over which a locomotive can haul a small tonnage train at slow speed. With brilliant foresight the engineers who planned the Ashley Planes 100 years ago, chose to do it the hard way. They proposed to haul freight cars up Solomon's Gap, on three inclined planes—*by wire rope.*

As revolutionary as this project must have been in 1843, the remarkable fact is that repeated tests prove it to be more economical than the longer route, even today. Under twenty-four hour operation, hauling an average of one million tons of coal, oil and mixed freight per month—this cable-hauled railroad equipped with about 100 tons of wire rope reduces transportation costs very materially.

Best visualized by the profile reproduced at left, the Ashley Planes, now operated by the Central Railroad of New Jersey, consist of three inclines of 5.7%, 14.65%, and 9.28% grade respectively. The total rise is 1,035.9 ft. up which 35 to 45 cars are hauled hourly at from 12 to 30 mph.

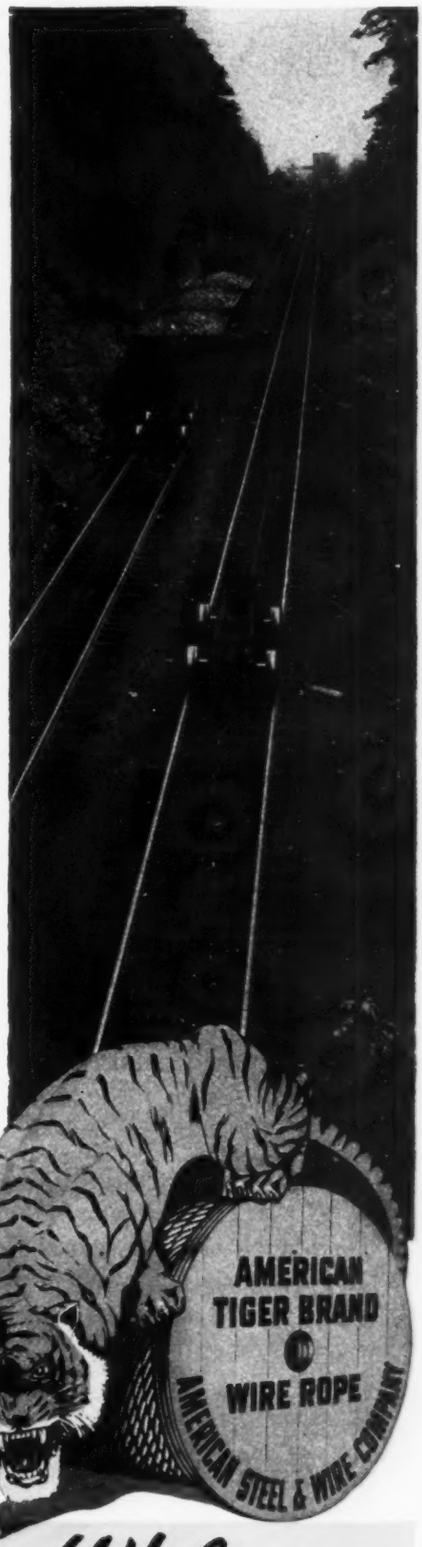
Each plane is a self-contained unit. It consists of a double track (with a truck pit at the foot of each track), and is equipped with its own hauling cable and two cable trucks or "barneys". A power house with hoisting engine at the head of each plane furnishes the motive power.

The hauling cable (2½" diameter on the top and bottom planes, 2¾" diameter on the middle plane with the heaviest grade) passes from one barney up the plane over supporting pulleys, then around 24-ft. diameter twin traction drums, then out through the bottom of the power house and back to the barney on the parallel track.

Close check is kept on the life of these hauling cables, and is measured in terms of tonnage hauled. We believe it significant that during the years when the planes were under full wartime capacity operation, and the equipment was being worked to the limit, American TIGER BRAND Excellay Preformed Wire Rope ran up the highest tonnage performance ever recorded! 19,804,642 tons on the No. 2 plane; and 27,972,495 tons on the No. 3 plane.

TIGER BRAND Excellay Preformed Wire Rope installed on the No. 3 plane in November 1943 has to date hauled 27,972,495 tons and is still in excellent condition. The performance of these ropes continues to break previous records.

These figures — substantially better than the former best with other wire rope used—speak for themselves as proof of the superior stamina, greater ruggedness and better service TIGER BRAND delivers, wherever used.



AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York
COLUMBIA STEEL COMPANY
San Francisco
Tennessee Coal, Iron & Railroad Company, Birmingham, *Southern Distributors*
United States Steel Export Company, New York
UNITED STATES STEEL

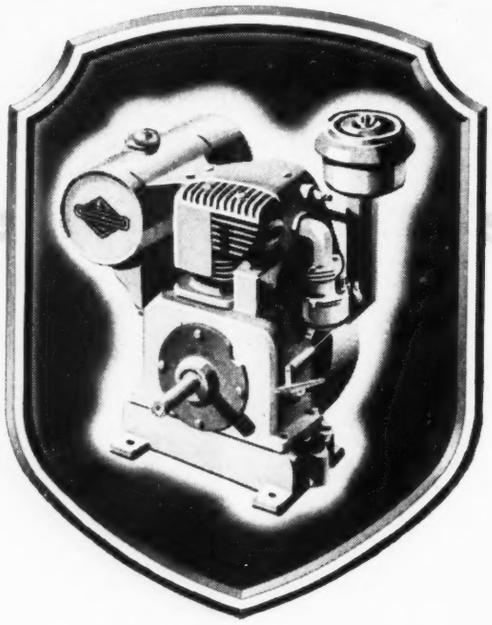
USS AMERICAN TIGER BRAND WIRE ROPE UNITED STATES STEEL

Excellay Preformed

U·S·S AMERICAN
TIGER BRAND *Wire Rope*

BRIGGS & STRATTON ENGINES

As Always – Foremost in Value and Performance



LOOK with confidence to Briggs & Stratton 4-cycle, *Air-Cooled* engines—"preferred power" in all fields—for the latest and most advanced developments for every application requiring ⅔ to 6 H.P. Briggs & Stratton with its concentration of technical knowledge, modern plants, equipment, and skilled workers—builds gasoline engines which are more than equal to today's most exacting power and performance requirements. You can expect *and get* more value per dollar if the appliances, farm machines, or industrial equipment you buy, sell or make are powered by Briggs & Stratton.

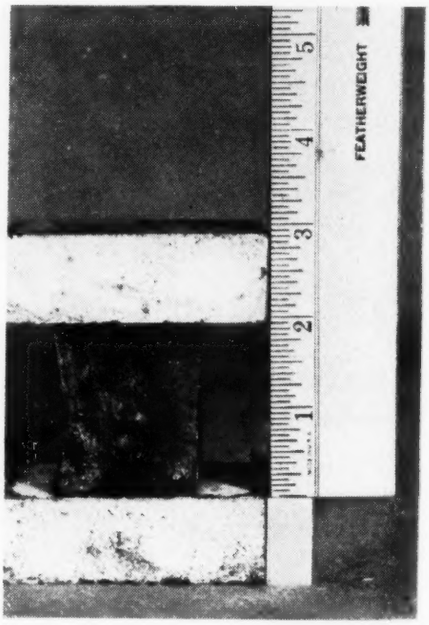
BRIGGS & STRATTON CORP., Milwaukee 1, Wis., U.S.A.

Air-Cooled Power

4 CYCLE
BRIGGS & STRATTON
GASOLINE ENGINES

JUNIOR MODEL PAINT PUMP, designed to supply up to five spray guns simultaneously, delivers paint, thinner, oils and similar spray painting materials to guns under controlled pressure without use of pressure pot. Because pressure pot is eliminated, pump can work directly from original material containers as well as from standard 10-gal. container provided with pump. There is no pressure on container; as a result, it can be refilled without stopping spraying operations. Because of difference in bore of air motor cylinder and pump cylinder, pump develops 1½ times as much pressure on paint lines as pressure on air intake into motor. An adjustable reducing valve permits regulation of air pressure driving pump. Unit is 32 in. high, 15½ in. in dia. and weighs 45 lb. Furnished with air surge chamber, (assuring smooth, uniform delivery of material), air regulator, pressure gage and air material line valves with standard spray fittings.—**Stephenson Air Brush Paint Co., 1630 Webster St., Oakland 12, Calif.**

HOT-POURED RUBBER ASPHALT COMPOUND, named Careylastic, and used for sealing joints in concrete paving and construction, is a product containing rubber, asphalt and other ingredients combined to form a positive seal for expansion joints throughout range of annual temperatures. This infiltration-proof seal is claimed to give protection considerably in excess of specifi-



cation requirements, retaining its resiliency and cohesion while permitting normal compression and recovery of non-extruding fiber joint filler. Eliminates expensive maintenance necessary when cutting out, cleaning and repouring ordinary joint seal is necessary each year. Method of heating and installing Careylastic is same as that followed in application of ordinary filler asphalt.—**Philip Carey Mfg. Co., Lockland, Cincinnati 15, Ohio.**

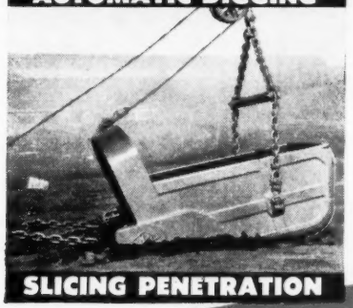
PMCO

America's Most Complete Line of Material Handling Buckets

Dragline Buckets

Sizes—⅜, ½, ¾, 1, 1½, 2, 2½ yds.

AUTOMATIC DIGGING



SLICING PENETRATION

Sharpest cutting edge of any dragline bucket

Bottom — One piece 14% manganese steel developing up to 120,000 p.s.i., making possible wide set corner teeth that break up material for easy, fast, penetration.

Body — Body sections tapered and rounded for easy dumping of wet sticky material.

Teeth — 14% manganese steel. Reversible socket type, easily removed for replacement. Kept tight in tapered socket by digging pressure.

See Your Equipment Dealer About PMCO Buckets

"Quality Since 1880"

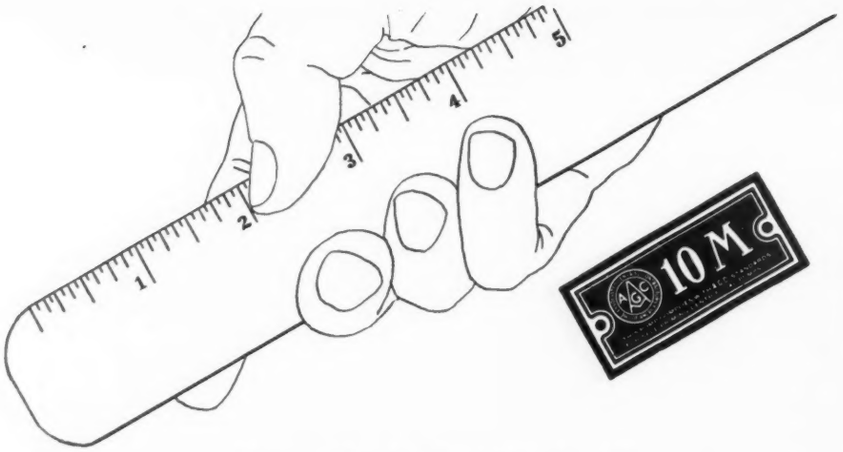
PETTIBONE MULLIKEN CORP.

CHICAGO 51, U. S. A.

We operate the largest and most complete manganese steel foundry in the United States.

AED MEMBER Associated Equipment Distributors

WE MAKE ALL FOUR BUCKETS



How Big Is Two Inches?

Silly question? Not at all, that is, when you're speaking of pump sizes . . . *and capacities!*

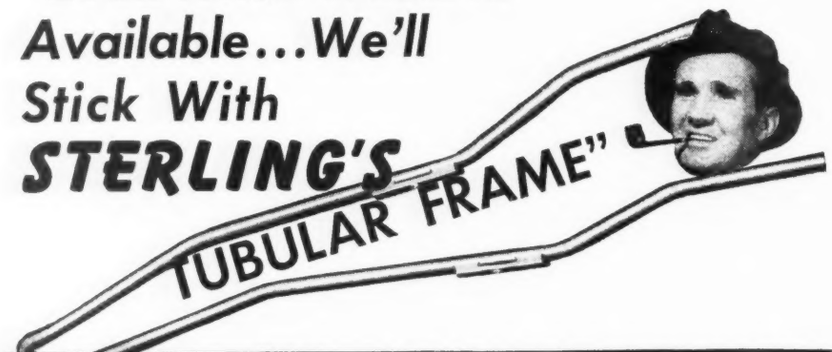
For the size of a contractor's pump alone does not guarantee capacity or performance . . . unless the pump bears an AGC rating plate. That plate is your guarantee that a 2-inch pump will deliver the capacity set up by the AGC Contractors Pump standards for that particular pump. It is your assurance that when you buy size, you get the capacity you want!

To eliminate the guesswork in buying pumps, choose one bearing the AGC rating plate. Be sure of capacity and performance in advance!

CONTRACTORS PUMP BUREAU

BARNES MANUFACTURING CO. Mansfield, Ohio
CHAIN BELT COMPANY Milwaukee, Wis.
JAEGER MACHINE CO. Columbus, Ohio
O. H. & E. MANUFACTURING CO. Milwaukee, Wis.
CONSTRUCTION MACHINERY CO. Waterloo, Iowa
MARLOW PUMPS Ridgewood, N. J.
Affiliated with
THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA, INC.
STERLING MACHINERY CORP. Kansas City, Mo.
CARVER PUMP CO. Muscatine, Iowa
THE GORMAN-RUPP CO. Mansfield, Ohio
NOVO ENGINE CO. Lansing, Mich.

"Even When Wood IS Available...We'll Stick With STERLING'S TUBULAR FRAME"



FORTIFIED FOR TOUGH USE AT POINTS OF STRESS . .

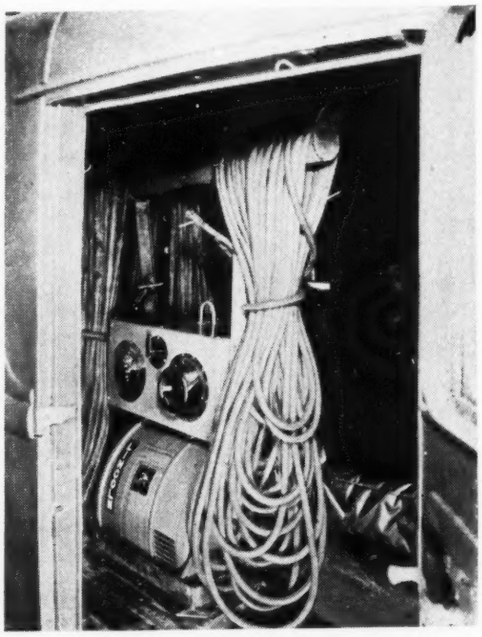
While wood remains on the "wanted" list, STERLING'S reinforced Tubular Steel Frame becomes more and more widely accepted among users as the most substantial material for barrows. The Tubular Frame can "take it" under all conditions, in all weather. In every way, it lives up to the well-known STERLING quality. When wheelbarrows are again available for prompt shipment, be sure to specify STERLING'S Tubular Frame.

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Look for this Mark of STERLING Quality

Sterling WHEELBARROWS

POWER TAKE-OFF, direct-connected to truck motor and eliminating conventional V-belt drive, can be installed quickly in any Ford or Dodge truck as a permanent set-up and can easily be removed or reinstalled in a few minutes. Built as a unit, driving mechanism fits directly over standard transmission case of truck and does not interfere with normal use of machine. Economical and convenient method



of supplying generator power from truck motor without use of belts. Power is transmitted directly from motor; thus speed of generator is same as that of motor. Governor, which can be cut in or out quickly, is connected with power take-off. Accompanying photograph shows this portable power arrangement used to drive generator for Lincoln arc-welding machine. Outfit is available as kit with complete instructions for mounting.—**A. Tangen, 3269 Hogarth, Detroit, Mich.**

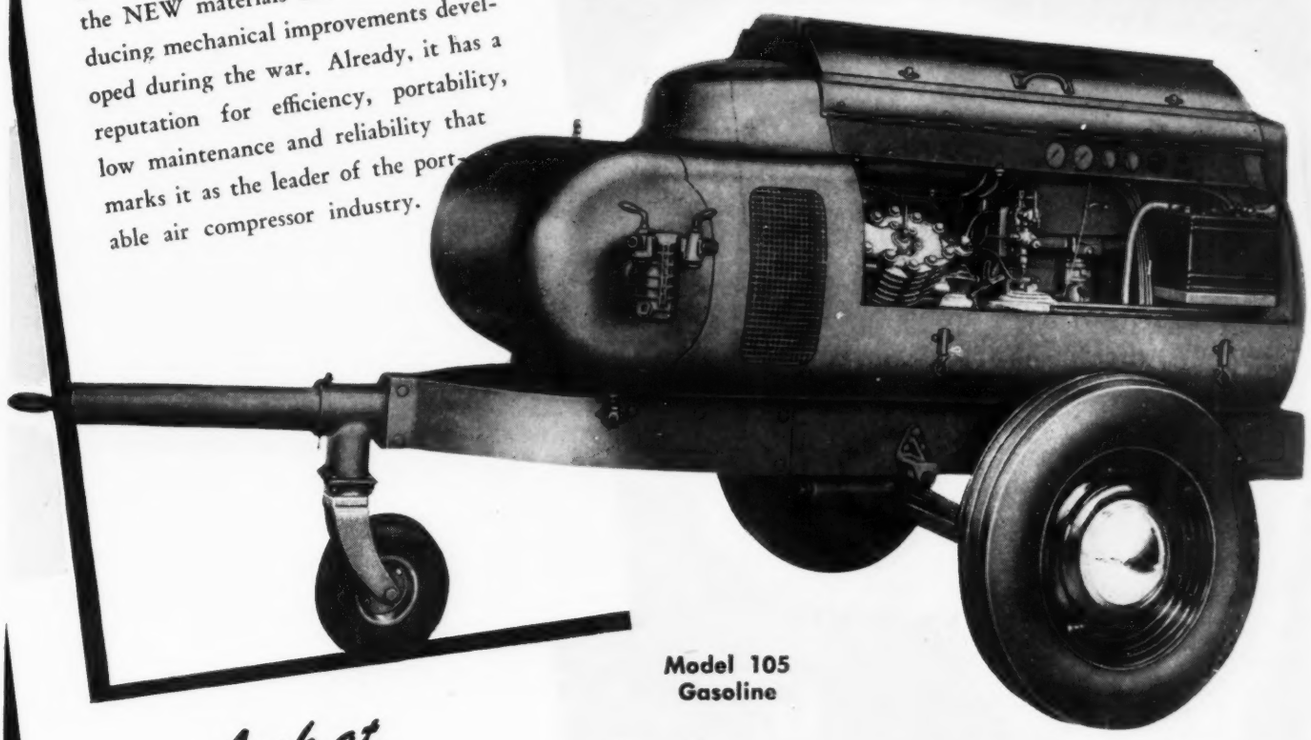
STEEL STOOLS have been designed from a physiological standpoint to meet every posture need in busy plants and to aid materially in increasing employee efficiency by reducing fatigue. Features: All welded, nonbreakable construction; unusually large comfortable 14-in.-wide seat with rounded corners; strong channel brace which provides footrest located at uniform distance below seat from all heights; steel glide type feet and pressed wood seat applied over steel for strength. —**Lyon Metal Products, Inc., Clark St., Aurora, Ill.**

ATTACHMENT FOR DRAGLINE BUCKETS is said to increase efficiency and pay load. Series of longitudinal bars are formed into unit which is attached to top of bucket with four bolts. It is designed to provide for fast loading and dumping when working in wet or dry material and to prevent spilling of material over back of bucket, especially when working in ditches or steep slopes. Can be applied to any standard make dragline bucket and weighs approximately 150 lb. in ¾ and 1 yd. size.—**Wellman Engineering Co., Cleveland, Ohio.**

PACE SETTER for the portable air compressor industry

The new Sullivan Series 80 is the first portable air compressor to incorporate the NEW materials and efficiency-producing mechanical improvements developed during the war. Already, it has a reputation for efficiency, portability, low maintenance and reliability that marks it as the leader of the portable air compressor industry.

the New SULLIVAN Series 80 Portable Air Compressor



Model 105
Gasoline

Look at all these Features

Matched engine • Direct-concentric valves • Two-stage compression • "Econo-Miser" control • Improved air cooling • Drop center axle • "Flexi-plane" drawbar • Single throw crankshaft • Oversize bearing surfaces • Cross-flow intercooler • Full Force-feed lubrication • "Cascade" oil cooling • Electric starters • "Bulkhead" body construction • Slow piston speeds • Lightweight pistons • Oil bath air cleaners • Oversize air receiver.

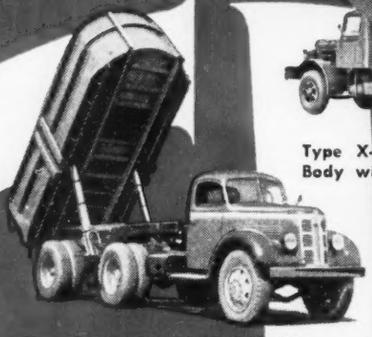
Here's the portable compressor you've been waiting for! It has every desirable feature that you are familiar with in a Sullivan portable, plus a lot of new ones that will make you agree that the new Series 80 is the finest portable on the market. You have never seen so much air-power, efficiency, portability, low maintenance and reliability packed so efficiently in so little space. The new Sullivan Series 80 is offered with gasoline or diesel engines and in many different sizes and mountings. See your nearest Sullivan distributor or branch office for all the details or send for Bulletin A-55. Sullivan Machinery Company, Michigan City, Indiana. In Canada: Canadian Sullivan Machinery Co., Ltd., Dundas, Ont.

SULLIVAN

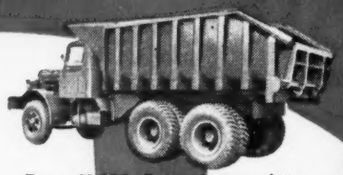
THE WORLD'S MOST MODERN PORTABLE - COMPRESSED - AIR PLANT

BETTER BUILT FOR BEST PERFORMANCE

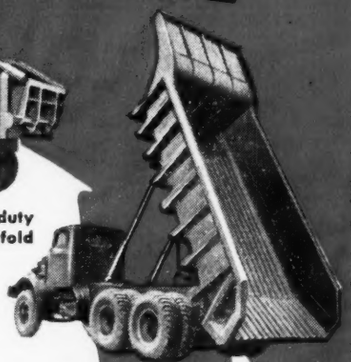
One way side dump Body with dual telescopic Hoist. Automatic downfold gate.



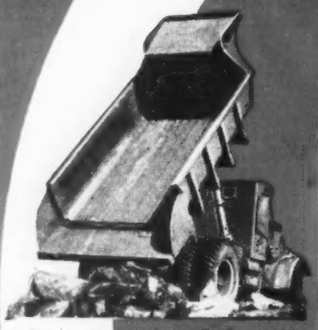
Type Q12 Body with Model T440 dual telescopic Hoist. Capacity 16 cu. yds.



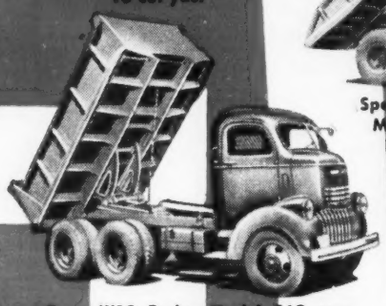
Type X-112 Extra heavy duty Body with automatic downfold tailgate.



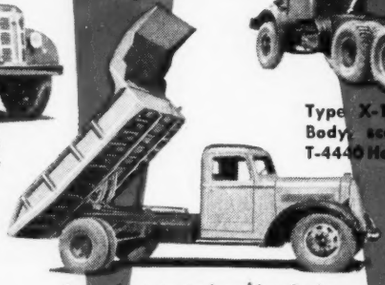
Type X-112 Extra heavy duty Body, scoop end, with Model T-4440 Hoist. Capacity 19 cu. yds.



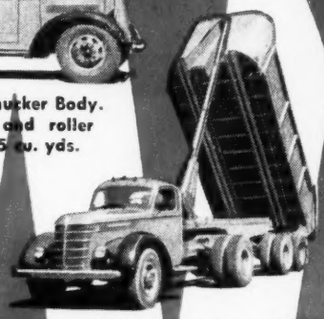
Rock excavating Body with downfolding gate.



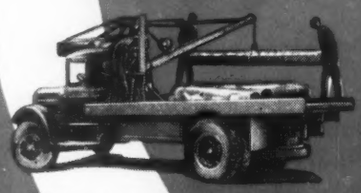
Type W12 Body—Model F4C cam and roller Hoist. Capacity 6 cu. yds.



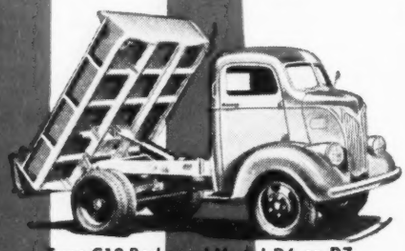
Special scoop end mucker Body. Model F8B cam and roller Hoist. Capacity 5 cu. yds.



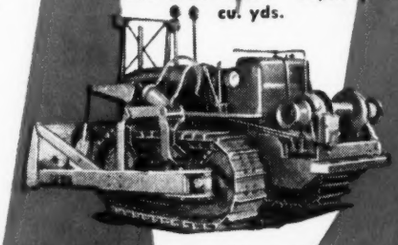
Type W12 Body, front recessed for Model TV83 Hoist. Capacity 15 cu. yds.



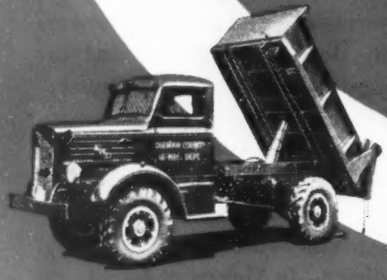
Telescopic boom Crane. Radius 8 to 20 feet.



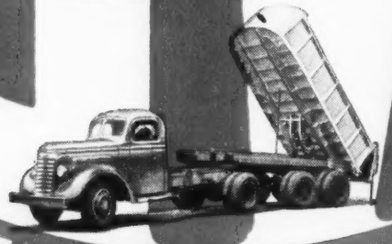
Type C12 Body and Model D6 or D7 Hoist. Dumping angle 55°.



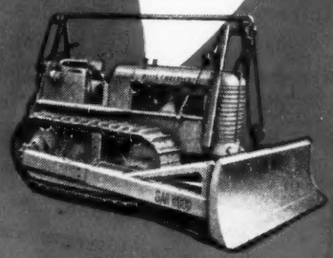
Bulldozer and rear mounted Winch.



Type W12 Body and single telescopic Hoist. Double acting tail-gate Capacity 4 cu. yds.



West Coast Special W-12 Body. Model F8C cam and roller Hoist. Capacity 10 cu. yds.



Cable Dozecaster with angling blade.

TRADE MARK

GW

TRADE MARK

GAR WOOD INDUSTRIES, INC.

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WORLD'S LARGEST MANUFACTURERS OF TRUCK AND TRAILER EQUIPMENT

OTHER PRODUCTS: TANKS • HEATING EQUIPMENT • MOTOR BOATS

NEWS OF
EQUIPMENT MEN

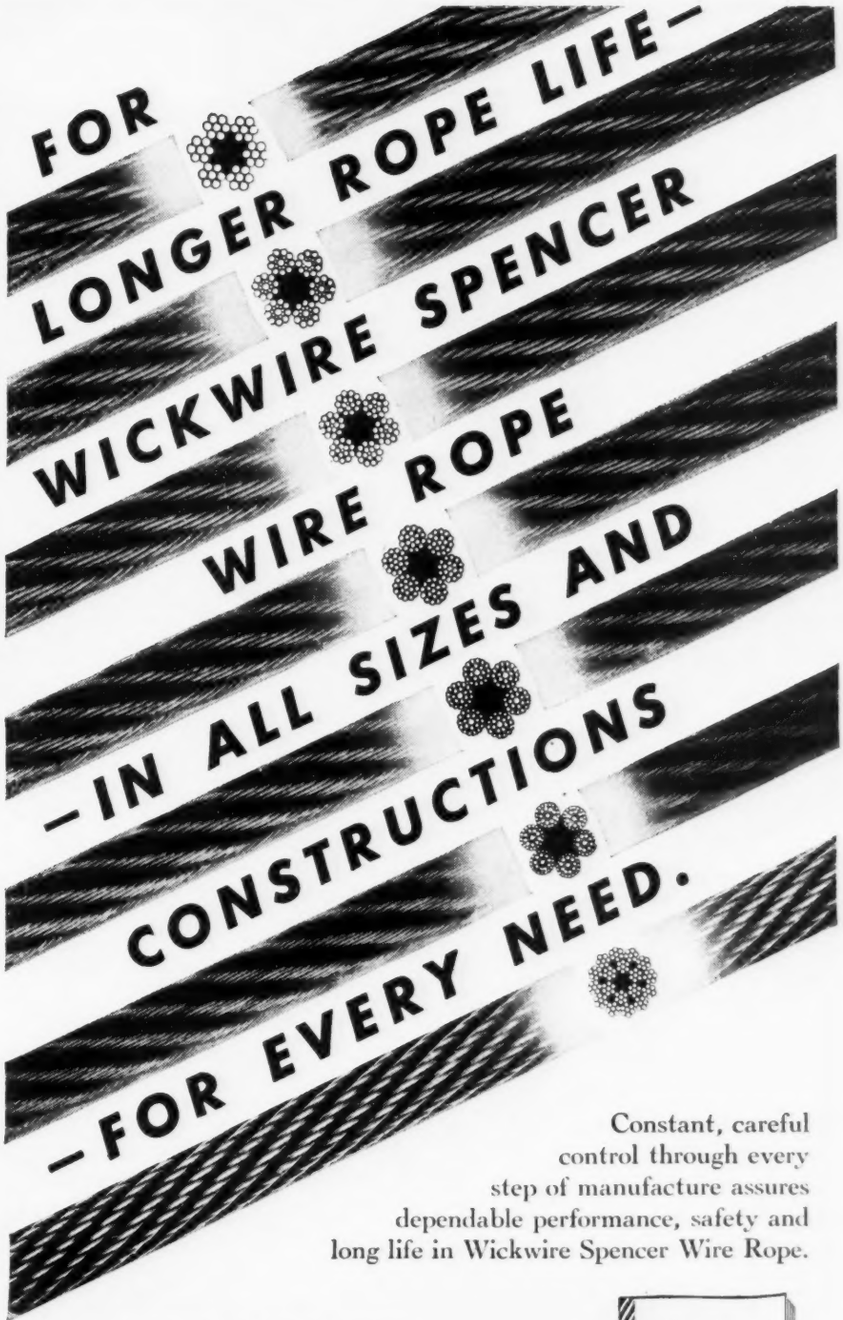
Joseph F. Heil (left) has been elected president of The Heil Co., Milwaukee, Wis., succeeding his father, **Julius P. Heil** (right), company founder, who will retain an active

interest as director and treasurer. The new president has been associated with the company since 1923 and during his father's four years as governor of Wisconsin, he was advanced to active management as executive vice-president.

Buffalo-Springfield Roller Co., Springfield, Ohio, has announced the promotion of **J. F. Harrison,** chief engineer and works manager, to vice-president in charge of engineering and manufacturing. The holder of many patents pertaining to construction equipment, Mr. Harrison is a member of the Society of Automotive Engineers and the Springfield Chapter, Ohio Society of Professional Engineers.

New president of the National Truck Leasing System, Inc., is Charles P. Clark, of Columbia Terminals, St. Louis, Mo.

Newly elected officers of Moretrench Corp., of Rockaway, N. J., are: **Edward J. Moore,** former vice-president, president; **Paul J. Jones,** vice-president in charge of Eastern Sales Division; **Lawrence G. Kelley,** vice-president in charge of Mid-West Sales Division; **Sanford P. Edgar,** vice-president in charge of Southern Sales Division; **Thomas C. Gill,** vice-president and chief engineer in charge of construction engineering; and **Edwin B. Singleton,** vice-president in charge of manufacturing and superintendent of all plants.



Constant, careful control through every step of manufacture assures dependable performance, safety and long life in Wickwire Spencer Wire Rope.

HOW TO PROLONG ROPE LIFE AND LESSEN ROPE COSTS . . .

Thousands of wire rope users—old hands and new—have found "Know Your Ropes" of inestimable value in lengthening life of wire rope. Contains 78 "right and wrong" illustrations, 41 wire rope life savers, 20 diagrams, tables, graphs and charts.

SEND FOR YOUR FREE COPY

Send your wire rope questions to

WICKWIRE SPENCER STEEL

A DIVISION OF THE COLORADO FUEL AND IRON CORPORATION
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SAVES

time where it counts the

MOST!

SOCONY-VACUUM OIL COMPANY, INC., and Affiliates: Magnolia Petroleum Company, General Petroleum Corporation of California

Out on the Job—in your maintenance department
his Complete Lubrication Service helps speed operations!

To minimize breakdowns and repairs—boost machine tput—Socony-Vacuum offers you the technically correct or grease for *every* part of *every* piece of equipment you use. rrect Lubrication helps keep . . . . . *Machines on Schedule!*

Regardless of *where* you operate, Socony-Vacuum's vast tribution system can cut down field interruptions for re- ling and lubrication, help simplify your inventory problems. r representative arranges . . . . . *Deliveries on-the-Job!*

To reduce "down-time" for overhauls and repairs, our mplete service provides job-proved maintenance schedules pted to your special needs—*plus instruction for inexperienced* on Correct Lubrication. Result . . . . . *Less Costly Maintenance!*

Aid with balky machines that disrupt schedules! If lubri- ion is the cause, our representative can make proper recom- ndations—in critical cases, will call in expert counsel to rect the trouble. You're sure of . . . . . *Help with "Problem" Equipment!*

hy Be Satisfied Merely With "Gas and Oil" When You Can Get Complete Service!

Tune in "Information Please"—Monday Evenings, 9.30 E. S. T.—NBC

"SUBWAY" AIR HOSE

STYLE D-142

ALL-SYNPLASTIC

The consistent use of "SUBWAY" throughout the years, is proof of its reliability and value for all heavy-duty air hose jobs. Perfectly balanced construction assures equal life and service for tube, carcass and cover under the most severe working conditions—no failure of one part to cause hose to be scrapped while remainder is still good.

"SUBWAY" is a Goodall "Standard of Quality" product . . . a registered symbol denoting our finest constructions in hose and belting. It guarantees to the buyer and user the ultimate in service life and efficiency . . . the means to maximum progress and profit on all air tool operations in construction, roadbuilding and mining.

OTHER GOODALL HOSE, BELTING, BOOTS, CLOTHING

The Goodall line includes air hose in various constructions; steam, water, suction, discharge and hydraulic hose; conveyor, elevator and transmission belting; boots, jackets, overalls, shaft suits, etc. All are made to Goodall's well-known standards for quality and durability . . . "Engineered to Your Job."

Contact Our Nearest Branch or Main Office for Details and Prices.

GOODALL RUBBER COMPANY • INCORPORATED

WE ARE PARTICIPANTS IN THE OWNERSHIP AND OPERATION OF NATIONAL SYNTHETIC RUBBER CORPORATION

THE GOODALL-WHITEHEAD COMPANIES

Philadelphia • Trenton • New York • Chicago • Pittsburgh • Boston
Los Angeles • San Francisco • Seattle • Salt Lake City • Houston

Factory—Trenton, N. J. Established 1870

Named to board of directors and executive committee of Tyson Bearing Corp., Massillon, Ohio, **P. W. Brown** will serve as director of production. He recently retired as director of manufacturing for Wright Aeronautical Corp. During the war Mr. Brown was a member of the Automotive War Production Council and chairman of the Manufacturing Coordinating Board of all companies manufacturing Wright products. **Paul J. Bastian** has been appointed Tyson vice-president in charge of manufacturing.

J. G. Curry has been appointed assistant sales manager of the Structural Products Division, Wickwire Spencer Steel, New York, N. Y.

Euclid equipment and parts will be distributed by Euclid-Memphis Sales, Inc., Memphis, Tenn. The organization is owned and operated by **R. A. Trippeer, Worthington Brown** and **Joel Gibbons.**

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WELLPOINT SYSTEMS

JETTING PUMPS

FOR SALE RENT

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Send for our New 60 page illustrated catalog

"GRIFFIN POINTED WELLPOINT FACTS" chock full of latest information on Wellpoint Systems for dewatering, emergency and permanent water supply systems, also information on pressure pumps and data for jetting.

GRIFFIN WELLPOINT CORP.

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Phones: MElrose 5-7704-5-6

10 *reasons why* Heil Cable Dozers

move more "pay dirt" at less cost

1 The center-lift construction assures full visibility for operator. He works faster and more accurately, for 60% of moldboard is visible at all times.

2 Ease of operation is assured because control lever is located at driver's side.

3 Lifting mechanism is mounted on tractor frame—heavy reinforcing fish plates attached to transmission case and engine frame carry load of overhead center lifting mechanism.

4 Heil design transfers imposed load to dead axle — no strain on tractor frame.

5 Short push arms at center balance point provide greater down-pushing pressure on blade cutting edge.

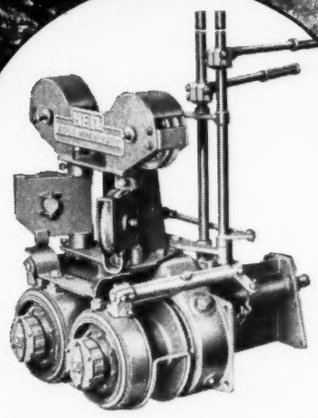
6 Down pressure at center point of tractor keeps track at full length on ground, utilizing entire drawbar horsepower of tractor.

7 Blade can be disconnected from tractor easily. Simply remove one sheave pin and four small nuts—tractor can be backed away from blade with cable remaining intact.

8 Mounting frame leaves whole track frame clean — does not cause dirt to accumulate at idler rollers.

9 Fast mounting job is possible because Heil equipment has a minimum of pieces and weight. Parts are interchangeable—which means less inventory.

10 Heil streamlined design does not detract from the tractor's appearance. All functions are coordinated to give you smoother operation, quick response to controls, and a better, cleaner, all-around job of dirt-moving at lower cost.



Dependable Power Control Units for All Makes of Tractors

Smooth operating brake and clutch assemblies eliminate shocks and jerks; the large drums run cool; sheaves are designed to reduce wear on cables. Fingertip control gives fast response for bigger yardage. Designed for all types of cable-operated equipment, on all makes of tractors.

Write for bulletins.

A Heil Cable Dozer gives you faster action, greater flexibility and handles the tough jobs easily.

See Your **INTERNATIONAL TRACTRACTOR DISTRIBUTOR**

B-68

ARMY E NAVY

THE HEIL CO.

GENERAL OFFICES • MILWAUKEE 1, WISCONSIN

then he said to himself

If it doesn't make sense . . . it's nonsense

ONE thing you can bank on when Foreign Secretary Anthony Eden talks . . .

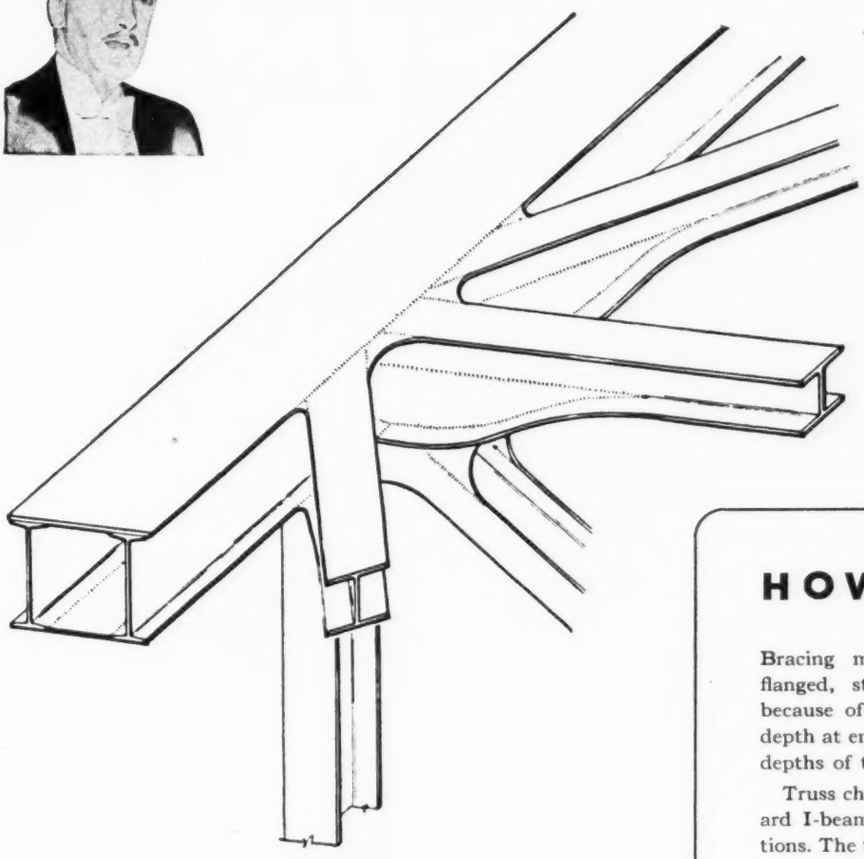
. . . he usually smacks his point with direct words.

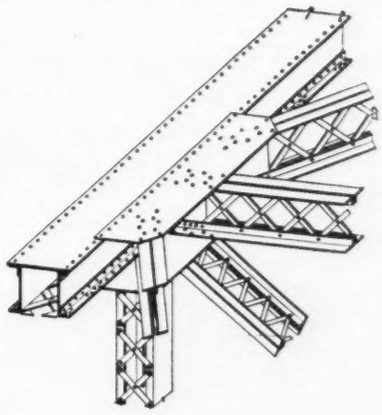
. . . Just weigh those he used in a recent speech before the House of Commons. Says he:

"Every succeeding scientific discovery makes greater nonsense of oldtime conceptions . . . "

AND THAT MAKES SENSE.

LOOK, A. E., how the welded design of lateral bracing MAKES SENSE:





CUTS WEIGHT 30%

. . . . IS STREAMLINED, EASY TO MAINTAIN

Want to eliminate the lacing bars, rivets, ring fillers and tie plates—excess material—from lateral bracing members? The welded design shown provides full depth solid web sections—rigid, strong, streamlined and easy to paint and maintain. Saves about 30% in tonnage.

HOW IT IS BUILT

Bracing members are made of rolled, wide flanged, steel bearing pile sections, selected because of their superior properties. Flared in depth at ends by means of welding to match the depths of truss chords.

Truss chords are fabricated by welding standard I-beams and plates together into box sections. The truss gusset plates weld to the bottom flanges of the I-beams opposite the webs.

Vertical truss posts are turned at 90 degrees to the plane of the truss to gain the greatest stiffness against the longest unbraced length of the member. In this position the vertical sway bracing frames directly into flanges of the post and end flanges of posts are easily flared out by means of welding to connect to vertical gusset plates at truss chords.

Complete discussion of this design is given in S.S.A.W. Plate 102. Free on request to structural engineers and designers.

THE LINCOLN ELECTRIC COMPANY • DEPT. 351 • CLEVELAND 1, OHIO

America's greatest natural **recourse**

ARC WELDING

Every HAZARD *Registered* SLING *is* PROOF-TESTED *and* TAGGED for KNOWN STRENGTH and SAFETY . . .

Hazard offers you a wire rope sling service—never before available. In the first place, Hazard supplies the exact type of sling you need for your particular job—whether standard wire rope, braided wire rope or cable-laid. You also have choice of standard terminals or newly developed, load-tested endings such as the ACCO-LOC Safety Splice and the U-LOC.

More than this, every Hazard Registered Sling is proof-tested to twice its rated capacity before it leaves the mill. Then it is numbered and indelibly marked with a metal tag stating its maximum safe load. You get a Certificate of Test and Registry which certifies to the sling's pre-determined safety. All Hazard Registered slings are made of LAY-SET Preformed Wire Rope—easy, fast and safe to handle. Write for literature.

ARMY (E) NAVY

ACCO

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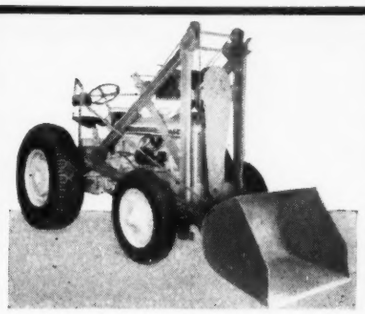
HAZARD WIRE ROPE DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

In Business for Your Safety

E. R. Galvin, former president of Tyson Bearing Corp., of Massillon, Ohio, has been named executive vice-president, general sales manager and member of the board of directors of LaPlant-Choate Mfg. Co., Inc., of Cedar Rapids, Iowa. Mr. Galvin previously served as general sales manager of R. G. LeTourneau, Inc., Caterpillar Tractor Co. and Cleveland Tractor Co. He had also been director of sales for the smokeless powder division of E. I. DuPont de Nemours & Co. He is a vice-president of the American Road Builders' Association. Other LaPlant-Choate appointments include promotion of S. L. Myers to vice-president and export sales manager and Jay M. Fetters to manager of foreign development.

A manufacturing research project devoted to the improvement of manufacturing methods and procedures for the entire line of International Harvester Co. products has been established in Chicago. It will be directed by **M. C. Evans,** manager of the company's manufacturing research and training department.



FRONT END LOADERS

for Industrial Tractors
Extensible Booms—8' Lift
1/2 and 5/8 cu. yd. Capacity

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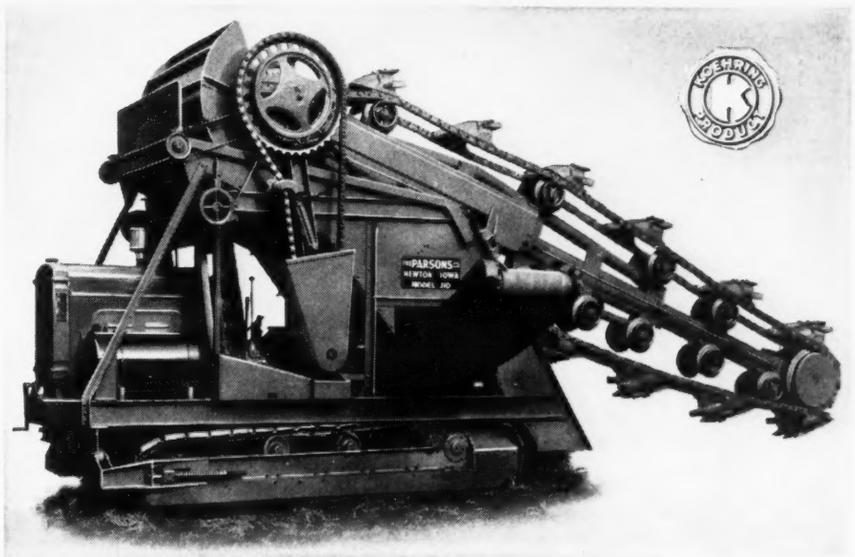
CONCRETE VIBRATORS
Gasoline Engine and Electric Motor Driven Models
HEATING KETTLES
for Asphalt and Tar
AGGREGATE DRYERS
for Stone and Sand
ASPHALT PLANTS
Portable — Stationary
WRITE FOR CIRCULARS

White Mfg. Co.
ELKHART INDIANA

6 FEET WIDE . . . 2 BUCKET LINES

310 PARSONS TRENCHLINER

Parsons 310 Trenchliner easily handles 2 bucket lines, digs efficiently up to 72" wide. Digs box sewers without shuttling. With 2 booms of varying lengths, it digs a step trench for simultaneous installations of water, gas or sewer lines in one ditch. The wide discharge chute, big engine and large capacity conveyor will handle the extra load economically.



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PARSONS COMPANY
KOEHRING SUBSIDIARY **NEWTON, IOWA**

TRENCHING EQUIPMENT PARSONS

Look for the Arm-and-Hammer
ARMSTRONG BROS.
BETTER PIPE TOOLS

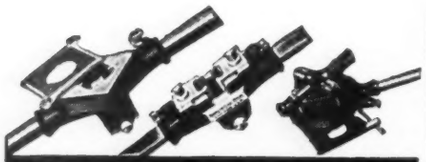
Threads of Lathe-cut Smoothness

Machined from special oil tempered Chrome-Vanadium Tool Steel, with hob-cut teeth "backed-off" from their ground cutting points; with accurately figured cutting angles and chaser rakes and ample chip clearance, these finer dies produce threads of lathe cut smoothness. They cut freely, faster, without drag and spin off the pipe without tearing or jamming.

Hardened, drawn, tempered and tested, they hold their keenness and free-cutting qualities.

They fit all standard made Stocks or Threaders—"Adjustable," "Receding" or "Solid"—come in all pipe sizes from 1/4" to 2".

ARMSTRONG BROS. Stock and Receding Threaders are improved in design, accurately balanced and machined inside and out.



ARMSTRONG BROS. TOOL CO.
"The Tool Holder People"
334 N. FRANCISCO AVE. • CHICAGO, U. S. A.

Eastern Sales Office: 199 Lafayette St., N. Y. 12
Pacific Coast Whse. & Sales Office
1275 Mission St., San Francisco 3, Calif.

China's reconstruction of industrial facilities will be assisted by **Ralph S. Lamie,** assistant to the export manager of the H. K. Ferguson Co., Cleveland and New York engineering and construction firm. Retaining his position with this company, he will go to Formosa as chemical consultant to the National Resources Commission of the Chinese government.

Kenneth F. Park, sales development manager of Caterpillar Tractor Co., Peoria, Ill., has been named consultant for the company's three sales divisions on all matters pertaining to the earthmoving field.

Officers elected at the annual meeting of the American Hoist & Derrick Co., St. Paul, Minn., are **Frederick Crosby,** chairman of board and executive committee; **Harold O. Washburn,** president; **Stanley M. Hunter,** vice-president of sales; **Donald B. Botkin,** vice-president of manufacturing; **James F. Bishop,** secretary and treasure; and **Robert J. Henry,** assistant secretary.

Junior Model with Horizontal Frame Attachment.

Will break 15 inch reinforced concrete walls up to 10 feet high. Frame attachment can be removed and boom tipped up to vertical position for breaking all types of pavement.

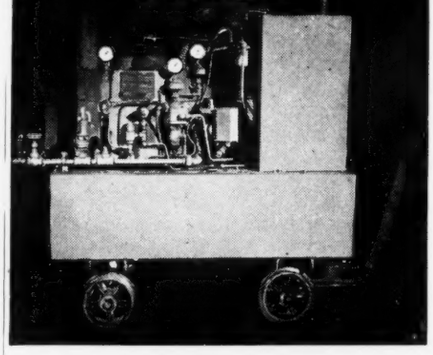
Ask about our

HEAVY-DUTY TYPE

RAPID PAVEMENT BREAKER COMPANY

1517 Santa Fe Ave. Los Angeles 21, Calif.

For Your Toughest Cleaning Job



NEW
OAKITE-VAPOR STEAM CLEANING UNIT

Tough maintenance jobs that call for steam-detergent cleaning either in the plant or out in the field can now be expedited with this new, quality-engineered stationary or mobile OAKITE-VAPOR STEAM CLEANING UNIT.

Check These Revolutionary Features:—

SIMPLICITY OF OPERATION: Single valve adjustment after starting provides simultaneous *two-gun* cleaning action at full operating capacity.

STARTING FROM COLD unit generates 100 lbs. pressure in one minute; 200 lbs. in two minutes.

60 GALLONS OF VAPORIZED CLEANING SOLUTION under pressures adjustable up to 200 p.s.i. in 1 hr.

SOLUTION TANK CAPACITY of 80 gallons assures extensive cleaning operation before recharging.

VIBRATIONLESS OPERATION even at pressures greatly in excess of requirements assures long unit life.

Use the OAKITE-VAPOR STEAM CLEANING UNIT on these maintenance cleaning jobs:—

Cranes • Crushers • Diggers • Excavators
Graders • Loaders • Mixers • Power Shovels
Rollers • Rippers • Tractors • Trucks

Illustrated Technical Data includes full description of unit, operating instructions, complete specifications, suggested uses. Bulletin gladly mailed FREE on request. Write TODAY!

OAKITE PRODUCTS, INC.
24B Thames Street, New York 6, N. Y.
Technical Service Representatives Located in All Principal Cities of the United States and Canada

OAKITE *Specialized* CLEANING

LOOK AT THE LENGTH...

...it's the key to an important Transite economy

THAT LONG 13-foot section of Transite Sewer Pipe you see in the photograph is one reason why handling costs are lower with this modern asbestos-cement pipe. Long lengths mean fewer joints to assemble—and, together with Transite's light weight, fewer man-hours to lay this pipe to line and grade.

Lower handling costs are one of several far-reaching economies possible with Transite Sewer Pipe. Others include:

Lower excavation costs. Because of its low friction coefficient (n = .010), Transite Sewer Pipe has an unusually high flow capacity. Thus, flatter grades, with correspondingly lower excavation costs, are often permitted.

Use of smaller pipe. Instead of using flatter grades, designers sometimes take advantage of Transite's high flow capacity to use smaller diameter pipe.

Reduced treatment costs. Transite Sewer Pipe joints combine tightness with flexibility and so guard against infiltration. Fewer, tighter joints reduce load at disposal plant, help keep treatment costs low.

Smaller treatment plants. Possible because Transite minimizes infiltration. Where new plants are being designed, substantial savings in the initial cost of construction and equipment may be effected.

More details on Transite Sewer Pipe for gravity lines are given in brochure TR 21-A; on Transite Pressure Pipe for force mains and water lines, in brochure TR 11-A. For copies, write Johns-Manville, Box 290, New York 16, N. Y.

Johns-Manville

TRANSITE SEWER PIPE *for gravity lines*

JM PRODUCTS

TRANSITE PRESSURE PIPE *for force mains*

The only help you need to make belt repairs **FAST**

BRISTOL'S BELT LACING

for rubber or woven conveyor belts up to 13/16" thick. Order from your distributor. And write for Bulletin 730.

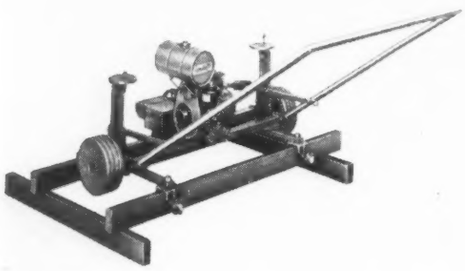
The BRISTOL Company
MILL SUPPLY DIVISION

150 BRISTOL ROAD, WATERBURY 91, CONN. *Distributors Everywhere*

BETTER CONCRETE
. . . in less time
. . . at less cost

Whiteman

CONCRETE EQUIPMENT



MODEL "RS" LIGHTWEIGHT RODDING MACHINE For screeding slab widths 3 to 10 ft. Also available in Model 44, for 10 to 20 ft. widths.

MODEL "J" LIGHTWEIGHT FLOATING-FINISHING MACHINE. Only 105 lbs.—provides easy handling and portability. 34" diameter (will go through 36" doorways).

Concrete finished by backbreaking hand work is slow and expensive. Why not get machine economy on small jobs . . . and produce concrete that's perfectly compact, level and smooth . . . with lightweight, portable Whiteman equipment.

Write for name of nearest distributor

CONCRETE EQUIPMENT Whiteman MANUFACTURING COMPANY LOS ANGELES CALIF. U.S.A.

Whiteman MANUFACTURING COMPANY
3249 Casitas Avenue
Los Angeles 26, California

The Novo Engine Co., of Lansing, Mich., has appointed **Lee M. Corless** as chief engineer. Recently released from active duty as a colonel in the Transportation Corps, he was on the engineering staff of the Chevrolet Division, General Motors Corp. before the war.

New Western District manager of the Le Roi Co., of Milwaukee, Wis., is **William Z. Bancroft,** who was recently released from the Army Engineer Corps in which he had attained the rank of lieutenant colonel and served as executive officer to the director of military construction in the Office of Chief of Engineers. **Thomas V. Shea,** former staff engineer and general supervisor of fuel systems and equipment for the A. O. Smith Corp., has been named Le Roi Eastern District manager.

As consulting engineer in charge of the educational work of the Lincoln Electric Co., of Cleveland, Ohio, **R. H. Davies** will act as consultant on the use and design of welded steel in machinery manufacturing and structural construction.

The New York office of the Clay Sewer Pipe Association has been moved to Suite 2606, 26 Court St., Brooklyn. Larger quarters were necessitated by the appointment of **H. G. Carlson,** recently released from the U. S. Merchant Marine, as district engineer.

Named general superintendent of the Flexteel Division at the Ambridge plant of National Electric Products Corp., Pittsburgh, is **S. B. Knutson,** who has for the past 2 years worked on the engineering and development of corronizing for the Standard Steel Spring Co.

Paul K. Povlsen has been named vice-president and general manager of Maguire Industries, Inc., of Bridgeport, Conn. He was formerly vice-president in charge of production for the J. I. Case Co.

J. Robert Kelley, assistant to the president, Manning, Maxwell & Moore, Inc., of New York, N. Y., has been appointed executive vice-president.

Keep 'em on the Job...
with ***CORRECT*** LUBRICATION

A VITAL factor in keeping equipment available for continuous service is correct lubrication of *every part of the vehicle.* Failure of the smallest part—due to deficient lubrication—may put the entire machine in the shop . . . and shop time is non-revenue time.

Sinclair All-Point lubrication can be your guard against equipment lay-off. Sinclair lubricants are made for *specific* service at every individual point . . . to help keep machines moving.

Try . . . OPALINE MOTOR OIL for sure, safe engine lubrication . . . non-foaming OPALINE GEAR LUBRICANT with extreme pressure properties to prevent galling and scuffing . . . OPALINE CHASSIS LUBRICANT for stay-put protection in all weather . . . SINCOLUBE for assured, enduring wheel bearing lubrication.

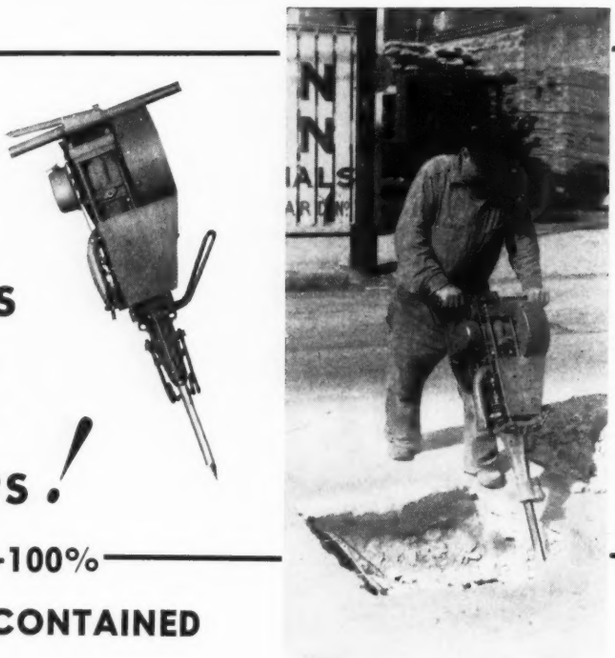
Let these tested lubricants help keep your equipment available . . . regularly and economically . . . always.

SINCLAIR LUBRICANTS-FUELS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY, 630 FIFTH AVENUE, NEW YORK 20, N. Y.

SYNTRON

the "ONE-MAN" GANG-OF-ALL-WORK!



BUSTS
CUTS
DIGS
TAMPS!

100%
SELF-CONTAINED

Gasoline Hammer

PAVING BREAKERS

Not a toy—but a man-sized hammer that will do a man-sized job.

A sturdily built, hard-hitting hammer that will save you MONEY, TIME AND LABOR, on those close-figured jobs.

Don't hesitate to write in for free literature.

NO
COMPRESSOR
HOSE
BATTERY BOX
CABLE
SPRINGS
That's SYNTRON

SYNTRON COMPANY
500 LEXINGTON HOMER CITY, PA.

POWER PLUS!
THAT'S SYNTRON

Eugene T. Scott has joined Templeton, Kenly & Co., of Chicago, as product application engineer. He served as Naval aviator and lieutenant for 3½ years.

New sales manager for W. & L. E. Gurley, of Troy, N. Y., is **Lester C. Higbee,** C. E., P. E., who has been with the firm since 1915 in various engineering, manufacturing, advertising and selling positions.

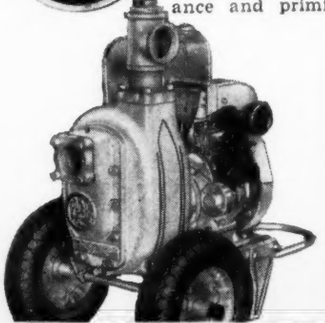
The Master Builders Co., of Cleveland, Ohio, has announced the appointment of **F. B. Hornibrook** as assistant director of research. For the past 5 years he has been assistant to the chief of the Cement and Concreting Materials Section, National Bureau of Standards.

Carl E. Nagel, recently discharged from Navy, has been named manager of Editorial Service for Westinghouse Electric Corp., Pittsburgh. He will be responsible for the company's technical and trade magazine articles.

General Cable Corp., of New York, N. Y., has announced the appointment of **Allen D. Pettee** as chief electrical engineer.

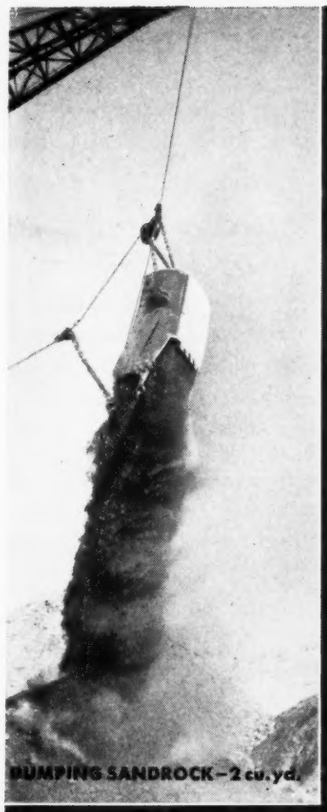
They Can Take It
DUAL PRIMERS

When it comes to DURABILITY, CMC Dual Primers have the "guts" to stand up to those tough, steady 24-hour grinds. DUAL PRIME means unmatched performance and priming speed.



A husky 3" CMC Dual Prime. One of the complete line from 1½" to 10" sizes. Also 3" and 4" Diaphragms. Get catalog.

CONSTRUCTION MACHINERY CO.
Waterloo, Iowa
Mixers • Pumps • Hoists • Batching & Placing Equipment • Saws • Carts • Barrows



BUMPING SANDROCK—2 cu.yd.

LEVEE WORK—2½ cu.yd.

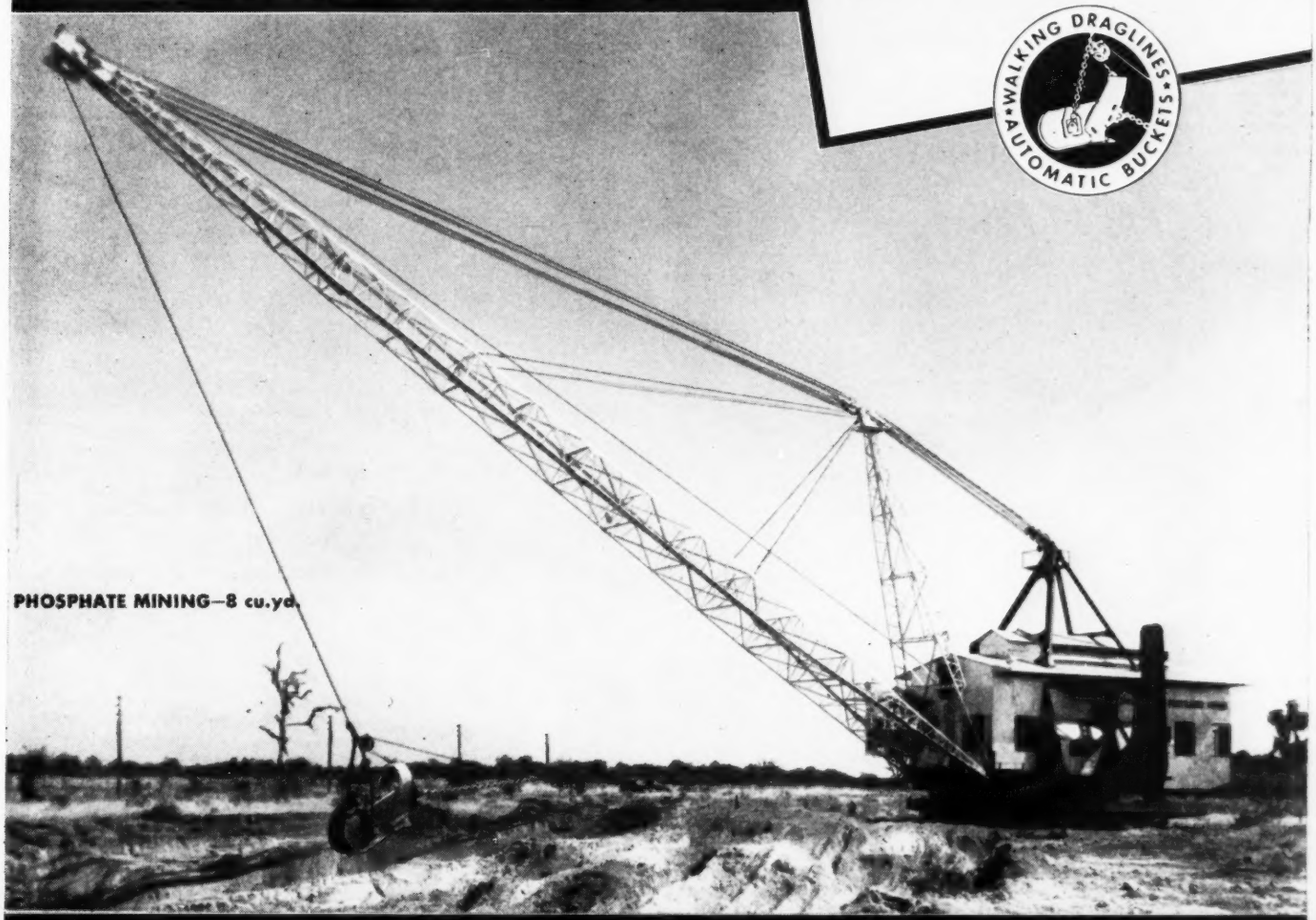
COAL STRIPPING—25 cu.yd.

PAGE

Automatic Buckets are PREFERRED for all types of digging

No matter how light or tough the material may be, the Page Automatic will always dig right in and come up with a full pay load.

WALKING DRAGLINES • AUTOMATIC BUCKETS



PHOSPHATE MINING—8 cu.yd.

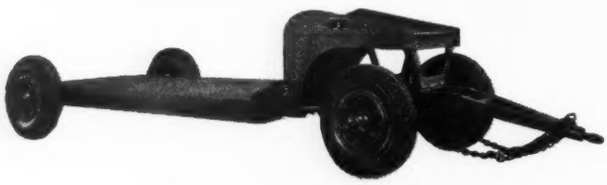
PAGE ENGINEERING COMPANY
CHICAGO 38, ILLINOIS

MERCER

"The Name that Carries Weight"

MATERIAL HANDLING EQUIPMENT

TRAILER TRUCKS



UNDERSLUNG FRAME T-859

Capacity 4 tons . . . Underslung steel frame. Safety plate, steel deck. Model shown equipped with pneumatic tires. Also available with solid rubber tires. Wheels mounted on Timken type roller bearings. This and all other Mercer Trailer Trucks (All types—All capacities) designed by engineers whose reputation is founded upon doing things right. Literature available. Inquiries invited.

MERCER ENGINEERING WORKS, INC.

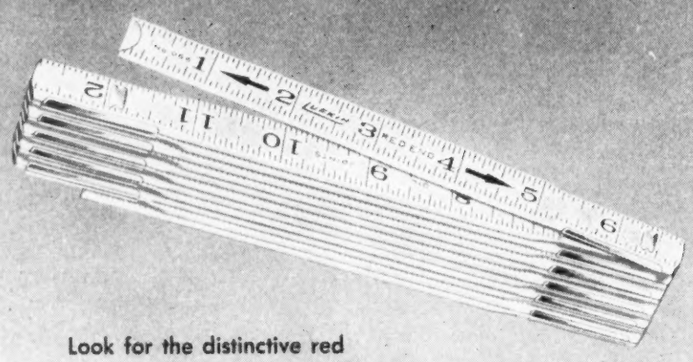
Plant: Clifton, N. J.

SALES REPRESENTATIVE

MERCER-ROBINSON COMPANY, INC.

30 CHURCH ST., NEW YORK 7, N. Y.

LUFKIN 066 "RED END" RULES



Look for the distinctive red ends when buying a folding wood rule—the finest rule of its type. Prominent markings. Brass lock joints, caps, strike plates—rust-proof throughout! Buy Lufkin "Red End" from your dealer. For free catalog write THE LUFKIN RULE CO., SAGINAW, MICHIGAN, New York City.

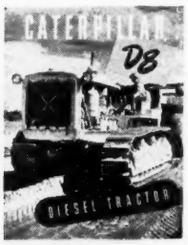
LUFKIN FOR DURABILITY

NEWS FROM MANUFACTURERS

About Their Products

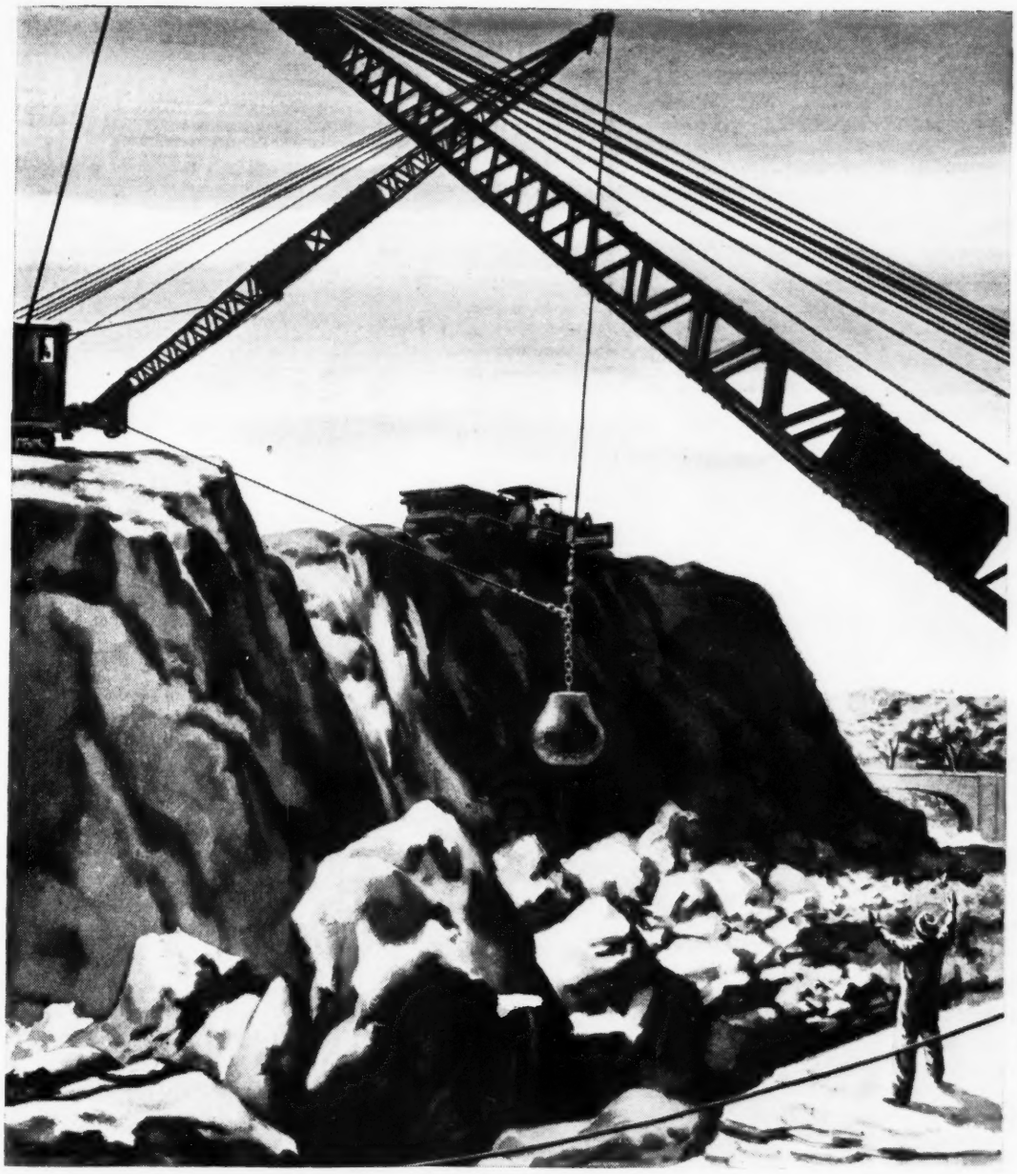
The publications reviewed below will keep you posted on latest developments in construction equipment and materials available for your use.

RADIANT HEATING—**A. M. Byers Co.,** Pittsburgh, Pa. (6 pp., illustrated) describes and illustrates application of radiant heating in modern industrial garage and service station. Covers installation of system within building, design of wrought iron pipe-heating coils, installation details, major component parts of system and its cost. Data on estimated heating load and heat losses and method of testing system are included, together with results obtained from operation of installation for first heating season. Photographs show overall sections of installations as well as close-up details of assembly of wrought iron pipe into grids and method of pouring concrete floor slabs in which they were incased. Sketch of complete pipe layout also is given showing size of pipe used, its location and spacing with relation to various rooms, windows and other openings.

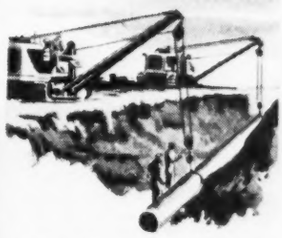


DIESEL TRACTOR — **Caterpillar Tractor Co.,** Peoria, Ill. (32 pp., illustrated) Describes and illustrates D-8 diesel unit with 113 hp. available at drawbar and with ample power for heaviest of scraper work, for logging big timber, for bulldozing and for many other types of work requiring high power. Each of two tracks provides length of ground contact of more than 8 ft. providing traction for heaviest of pulls, 34,180 lb. of weight enforcing that traction by holding grousers in ground to prevent track slippage. Describes advantages of diesel simple design, operating on low-cost fuel, controlled operating temperatures, Hi-Electro hardening of crankshaft and cylinder liners, positive all-weather starting, thorough engine lubrication, spring boosters as aid to easy steering and automatic seals for protection of final drive from mud and dust. Other subjects treated: welded box construction, free track oscillation for full traction; Hi-Electro hardened sealed rollers, shock absorbing recoil springs, long-lived tracks that grip and visibility and comfort for operator.

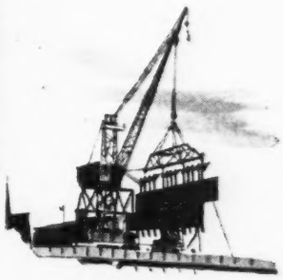
AIR COMPRESSORS—**Schramm, Inc.,** West Chester, Pa. (44 pp., illustrated) Includes pictures, descriptions and specifications for: Two-wheel trailers; four-wheel mountings; skid mountings; streamlined tool boxes; live hose reels; crawlers, railcars; electric motor-driven portables; motor truck mountings; power take-off units; engine drive in line stationary units; engine belt drive on base combinations, and special assemblies.



You'll see more and more jobs like these as the nation's new highway and airport building program gets under way. Skull-crackers and draglines use a lot of Preformed wire rope to get the material out.



Laying pipe lines is a fast job today with machines and Preformed wire rope. Improved methods and improved wire rope make the work easier and faster.



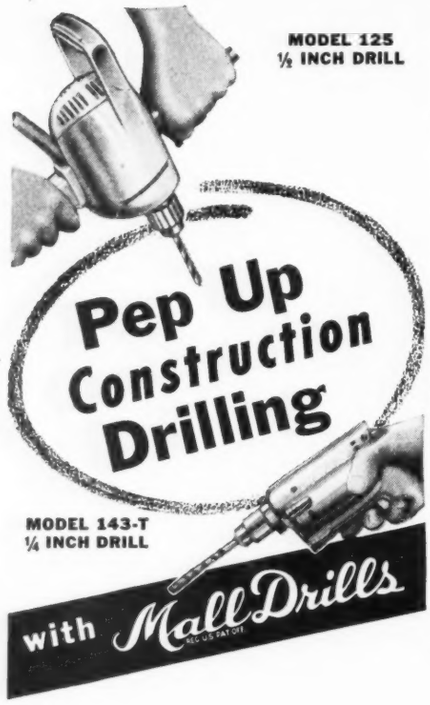
Do you worry when you see great weights lifted by shipyard cranes? The operators don't, for they know the Preformed wire rope will hold.

Here you see Post-War Progress in Action...

Wire Rope Makes it Possible

For the busy post-war days ahead, machines are rigged with Preformed wire rope. It lasts longer. It reduces time lost for replacement. It handles easier. It is safer. These operators and the front office agree Preformed is the rope for post-war progress.

ASK YOUR OWN WIRE ROPE MANUFACTURER OR DISTRIBUTOR



The speed—power and endurance of MallDrills pep up drilling in metal, wood or plastics. They keep heavy construction on schedule—facilitate remodeling and repair work and boost profits.

MallDrills run cool under long continuous use — are easily serviced without dismantling—have special steel alloy gears, self-lubricating bearings and extra long brushes.

Their lightweight, compact design and perfect balance make them easy to handle. Also increase workers' efficiency and stamina.

¼ inch and ½ inch capacity models operate on 110-volt A.C. or D.C. or 220-volt A.C. or D.C. ¼ inch drill is available in two speeds.

Ask Your Distributor for MallDrills, Mallsaws, Mall Concrete Vibrators, and Mall Chain Saws or write direct for literature and prices.

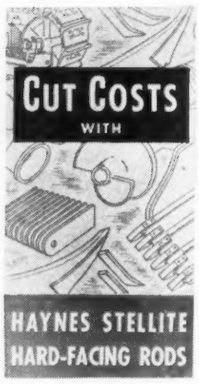
Mall Tool Company

7757 South Chicago Ave.

CHICAGO 19, ILL.

★ *25 Years of*
"Better Tools For Better Work"

CASTINGS AND MATERIALS TESTING DATA—**Baldwin Locomotive Works,** Eddystone, Philadelphia, Pa. (44 pp., illustrated) Gives composition applications and complete physical properties of 32 brass, bronze and iron alloys most generally used in industrial and engineering applications and furnishes formulas useful in calculating weight of castings and definitions of terms used in materials testing. Book should be valuable in reference files of engineers and executives in industrial field.



HARD-FACING RODS—**Haynes Stellite Co.,** Unit Carbide & Carbon Corp., 30 E. 42nd St., New York, N. Y. (6-p. illustrated folder) Entitled "Cut Costs with Haynes Stellite Hard-Facing Rods." Explains advantages of protecting wearing parts by hard-facing with this alloy. Lists typical parts that can be hard-faced in various industries and illustrates some of these parts.

DRY BASEMENTS—**Robinson Clay Product Co.,** Akron, Ohio. (6-p. illustrated folder) Describes vitrified clay skip-pipe to prevent cellar seepage. Explains how water collects in cradle at top of pipe and is discharged into pipe through fixed slots at each joint, while balance of water enters pipe through open joints maintained by arrangement of lugs in bell of pipe.

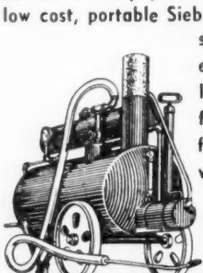
STEAM CLEANS FASTER

SIEBRING
PORTABLE-OIL BURNING
STEAM CLEANER

Saves Man Hours!

Cuts Repair Time!

Your repair shop or maintenance department can save many precious man-hours using the low cost, portable Siebring Steam Cleaner. Instant steam cleans faster and cuts repair time. It's automatic, burns fuel oil, natural or artificial gas. Its low cost will surprise you.



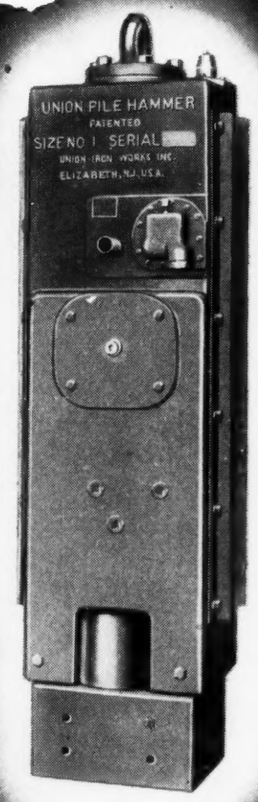
- ***Portable, easy to move.***
- ***Sturdy construction.***
- ***Safe to use.***

10 DAY FREE TRIAL
You risk nothing. Sold on 10 day FREE TRIAL basis. Write for full details.

WRITE FOR FOLDER
Write today for complete and illustrated descriptive material on this remarkable steam cleaner. Address your inquiry to Dept. 700.

SIEBRING MANUFACTURING CO.-GEORGE, IOWA

The PILE HAMMER *that seeks Perfection*



A perfectly-designed pile hammer should be sturdy and durable, have parts that are simple, accessible and few in number, and should have an effective means of lubrication. Write for bulletin No. 184 and check Union specifications.

UNION IRON WORKS
INCORPORATED
Established 1900
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● **Gross Weight**

● **Dipper Capacity**

BY ANY YARDSTICK

● **First Cost**

● **Operating Cost**

NO TAIL SWING permits work in close quarters

. . . the ¾ Swing Badger, with its low center of gravity (for digging power), and lighter swinging weight (for more swings per minute), moves *more material, faster* and *cheaper.*

AUSTIN-WESTERN COMPANY
AURORA, ILLINOIS, U. S. A.

BUILDERS OF ROAD MACHINERY

Austin Western

SINCE 1859

THE OWEN BUCKET CO.

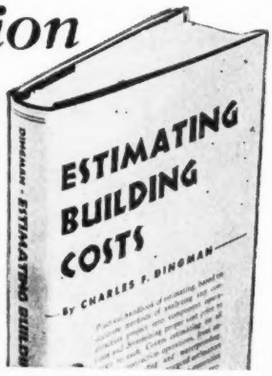
6020 Breakwater Avenue Cleveland, Ohio

Branches: New York, Chicago, Philadelphia, Berkeley, Cal.

Get set for post-war building construction

--make every bid count!

Put this handy Dingman pocketbook to work, in making accurate estimates for building construction, in saving time and error in the job of determining profitable, competitive prices. Based on the most practical experience, it is full of helpful pointers for new or experienced estimators, shows how to determine quantities of labor and amounts of material to produce a unit of completed work in practically every branch of building construction.



Third Edition

ESTIMATING BUILDING COSTS

By CHARLES F. DINGMAN

Architectural Engineer

401 pages, 4 x 6¾, 27 illustrations, $3.00

every construction job into its component parts, to apply cost data, adjusted This practical guidebook of estimating trains the estimator to analyze to living conditions, to the several operations necessary, and to calculate a price that will approach the actual cost of doing the work as closely as is humanly possible.

ESTIMATING BUILDING COSTS tells how to make an estimate on a wood, brick, or concrete building construction, and covers every operation from excavating to roofing and waterproofing with valuable material on such important details as fireproof construction, shingling, steel sash, or cement gun work. Included also are a number of useful data tables, but its primary purpose is to give the step-by-step methods that will train the reader to become a thoroughly competent estimator. This book helps you to make sure that no element of the work is overlooked, and explains the special factors to watch in dealing with each type of work.

While essentially a book of methods, ESTIMATING BUILDING COSTS contains 227 data tables and other useful reference features for the estimator, such as a reminder list of job elements, and a number of practical mathematical formulas.

Practical features

- Covers earth handling and moving so fully that the data are applicable to building operations of practically any scope and size, also to other construction operations involving this work
- Contains extensively rewritten and expanded sections on handling and finishing concrete
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SUPERCHARGING FOR GREATER POWER AND IMPROVED PERFORMANCE—**W-B Superchargers, Inc.,** Milwaukee, Wis. (20 pp., illustrated) Gives history of supercharging, mechanical principles of Roots type, positive displacement supercharger, and methods of manufacture and applications. Shows wide range of applications on all types of marine, industrial and automotive engines, either gasoline or diesel. Describes advantages in application to internal combustion engines.

Caging a Creek

(Continued from page 93)

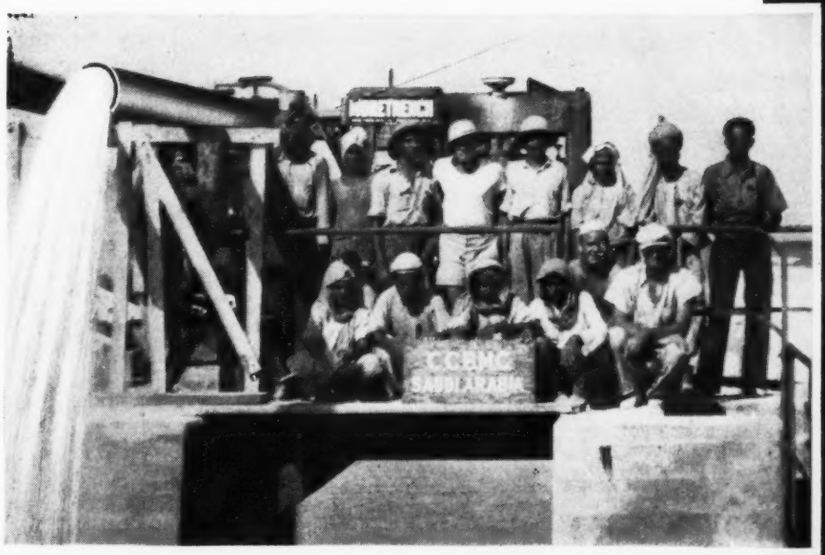
with a high boom, but only a 15-ft. panel on the far side.

By an ingenious revision of the support system for the outside form panels the contractor is saving considerable time and money. The panels were intended to set on angle brackets fastened to the side of the invert by anchor bolts, which would have been unrecoverable. Besides, the bolts, cast in the invert, would have extended out so far that additional excavation would be necessary at the base of the bank slopes to allow room for moving the invert forms out to clear the bolts in stripping. Weber uses the same 6x6-in. angle brackets, but has replaced the bolts with lag screws and expansion sleeves. The screws and sleeve assemblies are placed through the invert forms, and the sleeves are incased in the base concrete. In stripping the forms, the lag screws are removed first, which permits a vertical lift on the forms. Then the angle brackets for holding the wall forms are attached to the invert concrete by the same lag screws replaced in their respective expansion sleeves. Thus, the only material lost are the sleeves.

Readymix Concrete

All concrete comes to the job in transit mixers, and is placed by a bottom dump bucket handled by the truck crane. The weekly paving schedule on the boxes (90 ft. length,

(Continued on page 158)



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All over the world, as well as here at home, Moretrench Wellpoint Systems have been used for years to insure dry digging on every type of project—locks, dams, dry docks, sewers, pipelines, building foundations.

Whether you're bidding a twenty million dollar power plant in China, or a small sewer in Oneonta, our facilities are at your service.

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Does a MORETRENCH WELLPOINT SYSTEM save money? You bet! And time and tempers too.

Next time you have a wet one, try it and see!

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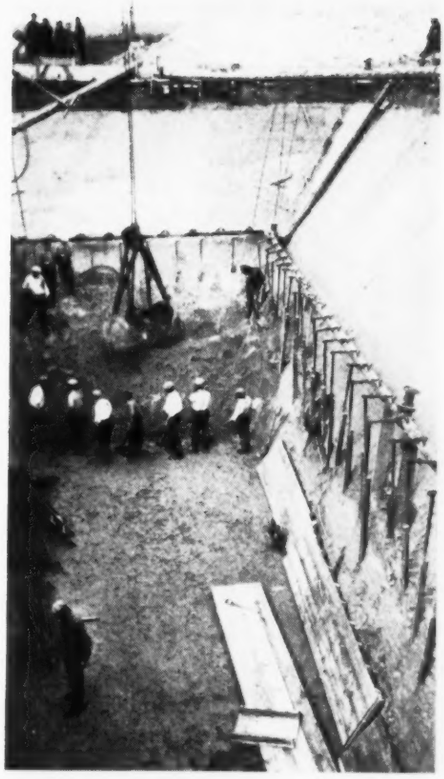

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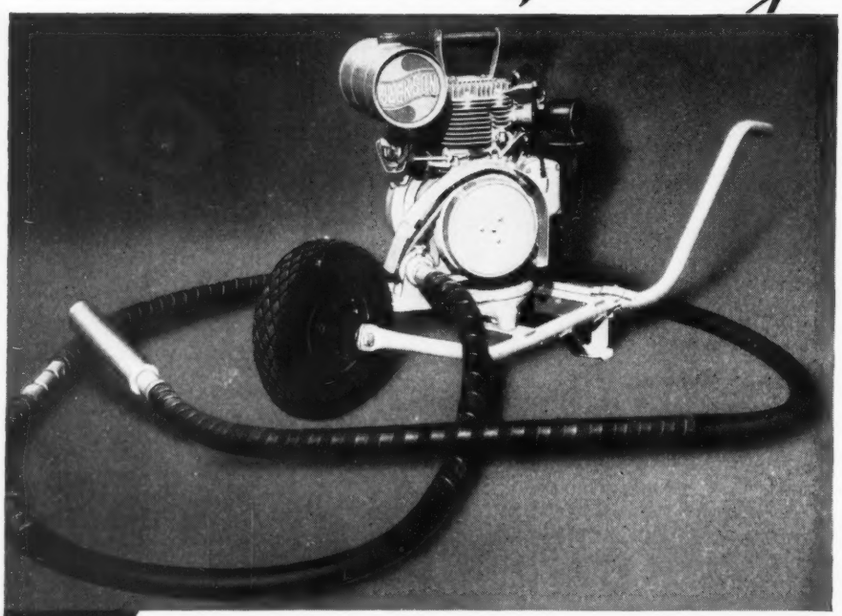


Available with three standard vibrator heads for thin, thick and medium sections and powered by a husky, dependable Wisconsin engine, the JACKSON model FS-6A does a perfect job of handling the stiffer more economical mixes in an exceedingly wide range of operations. Flexible shaft (1/2" core) is furnished in 7' to 14' lengths up to 28 ft. Unit has full swivel, dirt-proof base. Variable speed control up to 7500 V.P.M. Wheelbarrow with drop handles is optional. A highly advantageous unit for the general concrete contractor — built to the high standards of quality for which JACKSON equipment has always been famous. See it at your JACKSON distributor or write for complete information. The JACKSON line contains the best bet for every specific concrete vibratory purpose.

ELECTRIC TAMPER & EQUIPMENT CO.
LUDINGTON MICHIGAN

(Continued from page 156)

300 cu.yd.) is: Pour Monday; move forms and set reinforcing steel Wednesday; pour Thursday; move forms and set steel Saturday. Invert sections are poured Tuesday and Friday.

For the city, Milton M. Kinsey is president of the Board of Public Service. The job comes under the Sewers and Paving Section, for which Guy Brown is chief engineer. Harold Horan is construction engineer in charge, and J. E. Powers is resident engineer. For the contractor, Ben Taylor is superintendent.

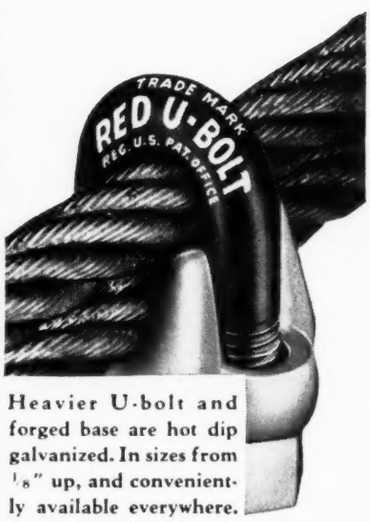
Term Financing

(Continued from page 89)

that his company would receive payment in full for each transaction and would be relieved of credit losses, contingent liability and collection expense on all accounts ac-

(Continued on page 160)

STRONG FASTENING THAT'S LONG-LASTING



Heavier U-bolt and forged base are hot dip galvanized. In sizes from 1/8" up, and conveniently available everywhere. A product of the American Hoist & Derrick Co. of St. Paul.

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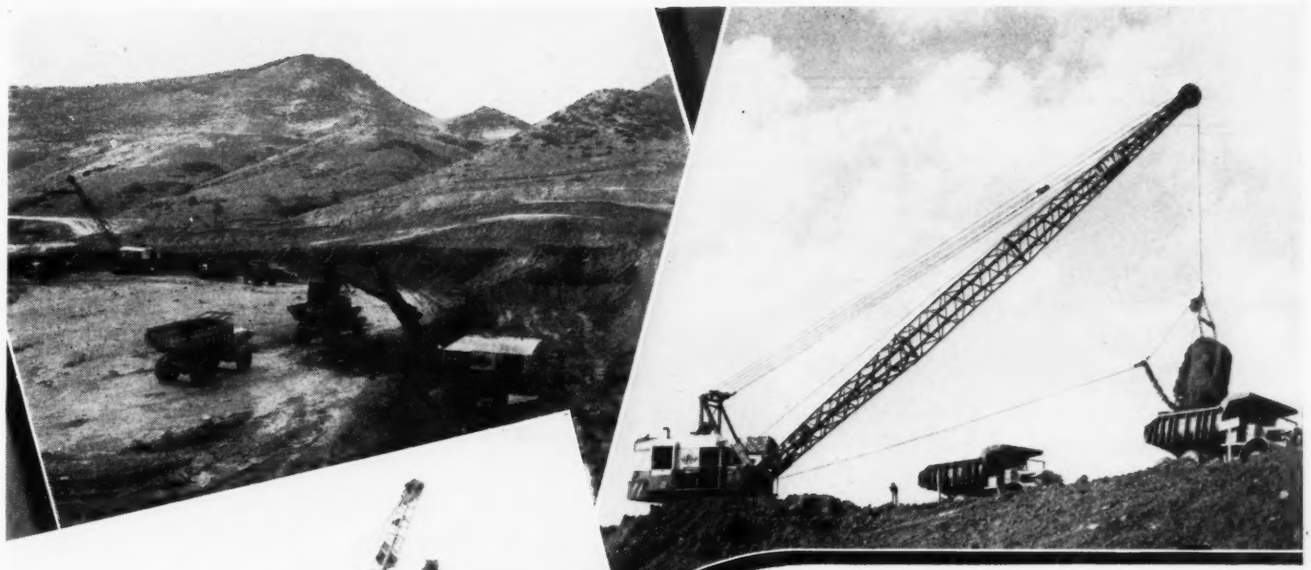

LIMA shovels, cranes, draglines, clamshells and pull-shovels are built to match the job. They are easily converted in the field, from one combination to another without a lot of extra work. This advantage makes it possible to handle many different kinds of excavating and crane work with one machine. You simply change front end equipment to match the job to be done. When you make your next equipment purchase, consider the wide range of application afforded by LIMA and assure yourself of the greater profits that come with an all-purpose machine. Other LIMA advantages are: independent clutches, anti-friction bearings at every important bearing point, fast, mobile crawlers, and air control on the larger types. A LIMA is identified by the diamond on the cab, an emblem of quality for 75 years.

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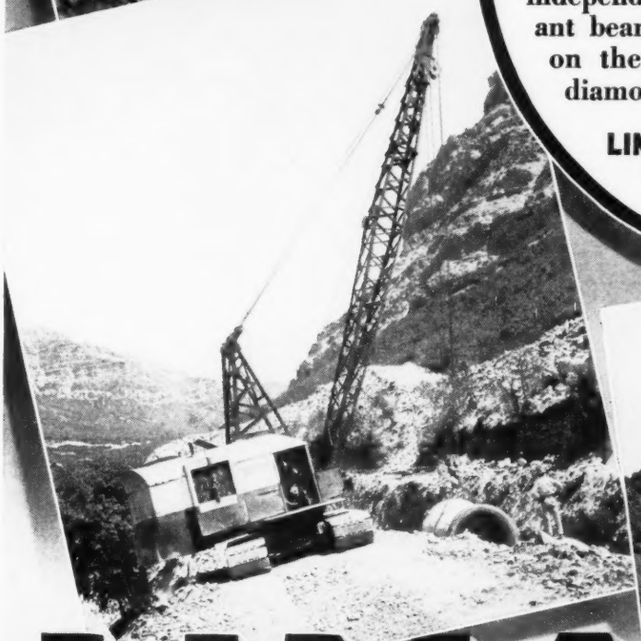

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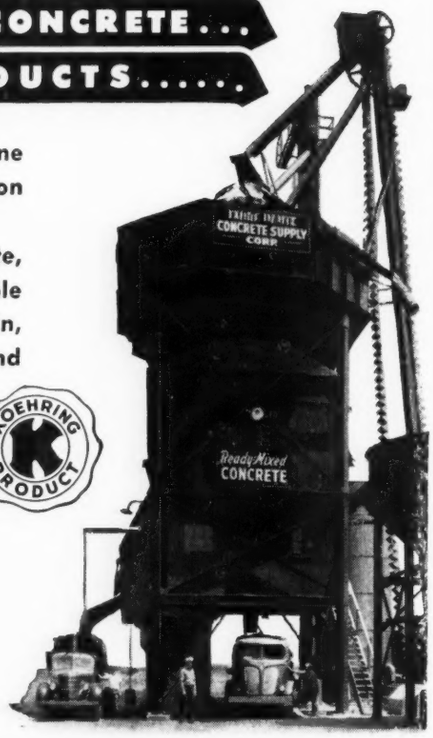

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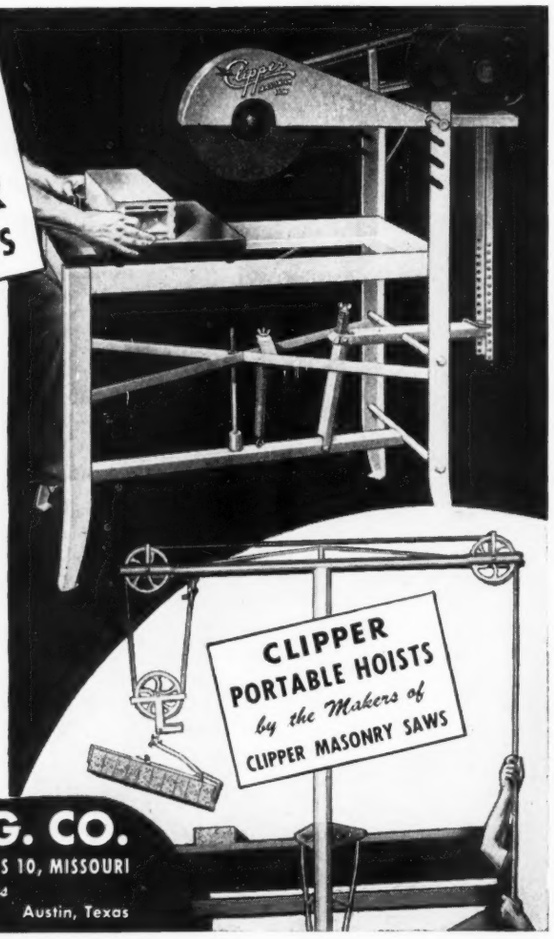

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(Continued from page 158)

cepted credit-wise by the finance company. Whenever Doe Equipment Co. elects to sell machinery to a customer who cannot meet the usual credit requirements, we have agreed to finance such installment sales subject to a re-purchase agreement in the event of default in payment. This flexible sales financing arrangement permits the dealer to sell equipment to any contractor he chooses, without interference with his sales policies, credit concessions or personal relations with customers. Use of the combined wholesale-retail finance plan means that the Doe Equipment Co. can handle a greatly increased business on its present capital with minimum risk of loss.

Installment financing plans thus described differ from old-line methods by taking into full consideration future prospects as well as past performance. Special financing methods can be arranged and applied to meet individual requirements. Each method serves the specific need of the contractor or distributor and provides a well-rounded financing program which will supply the ordinary needs of any construction business.

If a contractor can benefit through the unhampered use of additional capital for purchase of equipment, he need not hesitate to approach either his distributor or the finance company direct. Costs are reasonable and can be fully determined in advance. Before tying up valuable working capital in additional equipment, it would seem to be a wise business procedure to learn, at first hand, whether or not plans of the type described in this article would be helpful in smoothing the road ahead.

Fontana Dam

(Continued from page 99)

counterweight was required that was small and compact enough to be placed within the outer shell, but, still heavy enough to do the work. The answer was a half-circular segment of cast semi-steel bolted and welded to a heavy iron wheel. A safety catch prevents tripping accidentally. The Fort Loudon Dam shops set up an assembly line to

(Continued on page 162)

FOR AIRPORT RUNWAYS, ROADS AND CONCRETE PIPE

. . . the most widely used concrete reinforcement

Engineers make long life and economy doubly certain by specifying welded fabric reinforced concrete pipe to drain the country's airports.

Welded Wire Fabric, with its closely spaced small members of high yield point cold drawn steel, provides positive crack control in the concrete pavement slab.

THE QUALITIES which induced engineers and contractors to specify and use U·S·S AMERICAN Welded Wire Fabric reinforcement on many of the nation's airports have been proved during years of satisfactory service on the country's concrete highways.

Made of cold drawn steel, prefabricated by electric welding, American Welded Wire Fabric provides crack control through the superior reinforcing value of closely spaced high yield point steel wires. It gives the concrete slabs strength to resist shocks and strains in all directions. Should cracks appear, the welded wire fabric holds the faces of the crack tightly together and prevents rapid disintegration of the concrete.

Other advantages? Engineers and contractors can tell you that with American Welded Wire Fabric you use less steel (because of its close distribution of high strength members), reduce construction time and cost; that it is easily handled, quickly installed, lies flat and always stays in place.

When you are planning peacetime structures and highways, plan to give them the extra strength and durability which assure extra years of useful service. That has been done on existing reinforced concrete construction by billions of square feet of U·S·S American Welded Wire Fabric.

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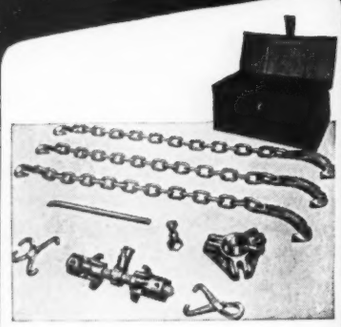
9-Piece Life Saver for Construction Men



No. 610 Util-A-Tool. 10-ton capacity. Pushes apart or pulls in 4¾" each grip. Weight 74 lbs. in metal box.

Many are the applications of the Simplex Util-A-Tool. New uses —all proving savings in time and manpower —are constantly being reported. Its 9 members are employed in many combinations to push, pull, tie forms, bind loads, clamp parts for welding, bend beams and pipe, straighten bent structural members, etc. Ask for Bulletin "P&P 43."

Templeton, Kenly & Co.
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The VIBRATORS workmen like to use

PERFECT BALANCE makes Viber Vibrators so easy to handle that better workmanship results—and faster work schedules may be maintained. VIBERS give you a constant, smooth speed of **9,500 RPMs IN CONCRETE**—the highest ever offered. Vibers are flexible, yet rugged, and all elements are interchangeable, including electric, pneumatic and gasoline motors.

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726 So. Flower St., Burbank, Calif.

VIBER
HI-SPEED CONCRETE VIBRATORS
ORIGINATORS OF INTERNAL CONCRETE VIBRATION!

(Continued from page 160)

turn out 30 of the new buckets, with a large part of the material coming from surplus and leftovers.

To trip the bucket, a workman simply rams the nozzle of a compressed air hose into a small socket at the base of the outer shell and turns on the air. In less than 2 sec., tests on the job showed, the concrete was in the form and the bucket was on its way back to the car. The old type bucket, tripped by a workman who climbed up the side and turned a wheel, took an average of 15 sec. to dump. Thus, the new design saved 13 sec. in placing every load of concrete.

Before Fontana Dam reached its height of 460 ft. above bedrock, more than 2,800,000 cu. yd. of concrete was poured. This meant that 700,000 buckets were shuttled out by the concrete trains, swung into the forms by giant gantry cranes, and then tripped. With 13 sec. saved on each of 700,000 loads, about 3 weeks total time was saved in concrete placing. The time-saving factor was of particular importance since TVA had undertaken to complete Fontana, a war power project, in 2 yr., though 3 to 5 yr. would have been a good, fast schedule.

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For many years McKiernan-Terry Pile Hammers have been the choice of engineers and contractors on major construction projects throughout the world. During the War, they were used widely by Army and Navy Departments for construction and reconstruction work on ports, bridges, dams, etc. in every theatre of operations. To meet these and other heavy demands of the Army, Navy and Maritime Commission, our Dover and Harrison, N. J. plants have been greatly expanded. These enlarged facilities are now available for the many peace-time projects requiring Pile Driving Equipment, Hoisting Equipment, Marine Equipment, Heavy Construction Equipment and/or Specially Engineered Equipment or Machinery.

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new concrete paving records with the MULTIFOOTE DuoMix 34-E Paver

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MULTIFOOTE ELEVATED BOOM

Get the extra building and construction jobs that require elevated pouring with the MultiFoote Elevated Boom . . . Not to be confused with limited scope "live" booms . . . Puts full loads up to 18 feet above ground level . . . Adjustable to lower elevations as needed.

Four Army-Navy "E" Awards for Production Excellence!

MULTIFOOTE CONCRETE PAVERS

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THE **GEBHARD** TAMPING ROLLER

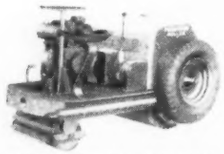
Designed to overcome the weaknesses and failures of similar equipment produced heretofore and to meet exacting requirements for greater compaction of earth fills.

Foot construction has been found to give greatest compaction, lightest draft and least disturbance to surrounding material.

The frame is hinged in the middle to allow each roller to follow contour of surface. Cleaner bars are designed and set to eliminate trouble from clogging.

Of rugged, welded construction, the Gebhard Tamping Roller is the ultimate in compaction.

GRADER BLADES



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Ferguson HEAVY DUTY RIPPERS

SHOVEL SUPPLY COMPANY *Manufacturers*
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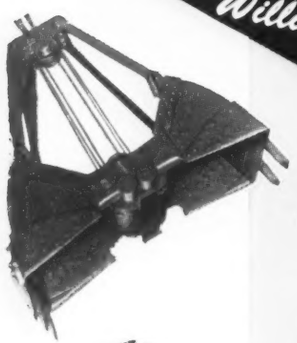
First to feature Welded Steel Construction
WELLMAN
Williams Type **BUCKETS**



Bucket users know that welded steel construction means longer service at lower cost. Wellman originated this finer type of bucket construction! A type for every service: Multiple Rope, Power Arm, Dragline, Power Wheel, Special Service; ⅜ to 16½ yd. capacity.

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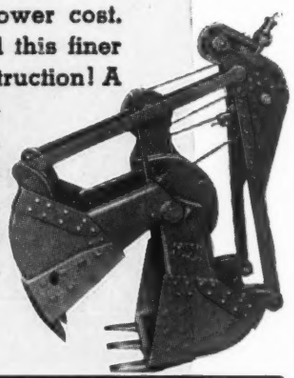


THE WELLMAN ENGINEERING COMPANY
7017 CENTRAL AVENUE • CLEVELAND 4, OHIO

Aluminum Houses

(Continued from page 83)

heating and air-conditioning unit.

All houses will be produced by aircraft manufacturers under subcontracts with the Fuller organization. At the Beech plant 200 houses a day will be mass-produced on lines side by side with the company's airplane production. Distribution will be handled through licensed sales and service agencies located throughout the country, similar to those used by the automobile industry. Emphasizing the fact that the new house is not a temporary or prefabricated unit but a mass-produced house entirely assembled at the site, Mr. Fuller exclaims that 10-man crews can put it up in two 8-hour days. Erecting crews of trained machinists will be maintained by local dealers. All parts, none of which weighs more than 30 lb., can be shipped in a 16 x 4½-ft. carton.

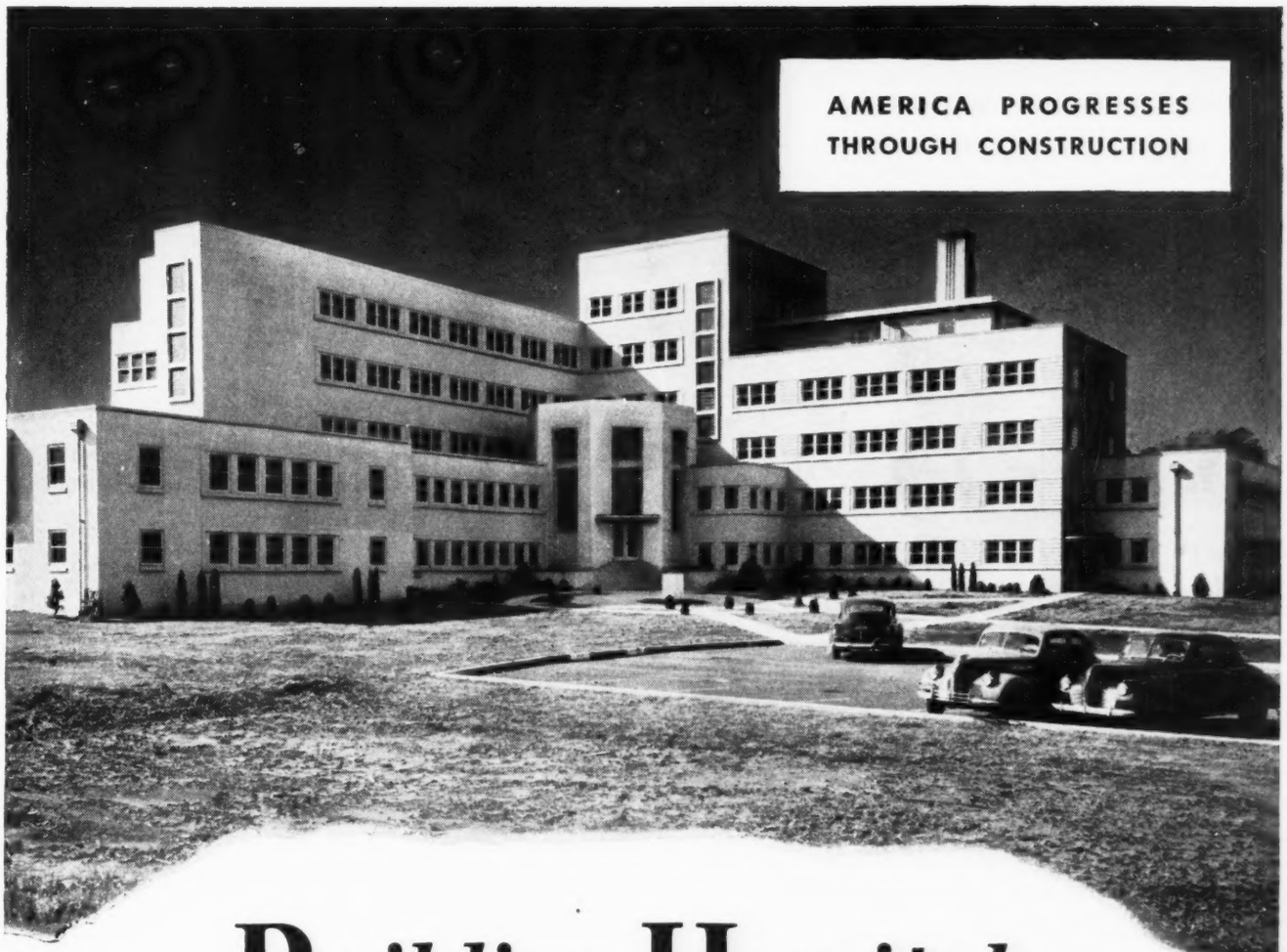
The Fuller board of directors includes a representative of the International Association of Machinists, AFL, and of the United Steelworkers of America, CIO.

Preventing Crane Boom Accidents

(Continued from page 102)

neither the operator nor the machinery. One of these is the parting or slipping of a heavily-loaded sling when the boom is high. Invariably, in such cases, the boom-line reaction will snap the boom over backward. Tests made by the writer showed that the breaking of the hoist line holding a 14-ton load was sufficient to cause a 60-ft. boom on a crawler crane to kick back over the cab from a boom angle of 65 deg. Similar tests with different loads applied to truck-mounted and

(Continued on page 166)



Building Hospitals

BUILDS WEALTH THROUGH HEALTH

THIS country needs from 1500 to 2000 new civilian hospitals and 2700 health centers, the U. S. Public Health Service reports. This need is emphasized because approximately 1200 counties, with a population of about 15,000,000 have no hospitals within their boundaries. The cost of supplying these National health needs would amount to more than $2,000,000,000.

In addition, the Veterans' Administration program calls for the construction of 77 new hospitals. The cost of these hospitals, together with additions and improvements to the 106 existing veterans' institutions, will be $448,000,000.

These civilian and veteran hospital facilities deserve the best in planning and execution. A. G. C. contractors have the skill, integrity and responsibility to construct these health projects of highest quality with maximum efficiency and economy. They are pledged to sound business principles exemplified by the A.G.C. emblem.

THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA
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REG. U.S. PAT. OFF.

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NEXT TIME . . Pull a FAST one!

GET RAPID, DEPENDABLE ACTION WITH

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PILE EXTRACTORS

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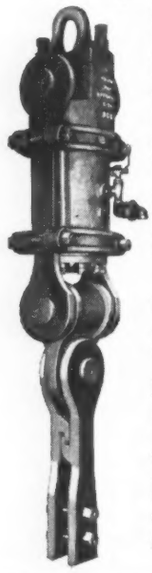
Mechanical features engineered on correct principles make Vulcan the fast, modern, economical pile extractor. Its parts cannot become disarranged and no assembly is necessary to place it in immediate service. The Vulcan has but one moving part, requires no adjustments, can't get out of order.



Proved since 1927 under both good and bad working conditions, the Vulcan Pile Extractor has justified every claim made for its efficiency, hardiness and performance. Three types built to handle every kind of pile extracting job. Write for full details.

VULCAN IRON WORKS Since 1852

331 North Bell Avenue

Chicago 12 ---Illinois

(Continued from page 164)

floating cranes showed equally disastrous results.

Floating or barge-mounted cranes are particularly susceptible to boom accidents because of tilting and surging of the barge under load and due to wave action. Parting of the load line, slipping of the grapple or hook or failure of slings, especially under conditions of barge side list, will throw a high boom over, its reaction often aided by surge or return of the barge to normal position.

Crawler cranes, working on a soft fill, with a high boom, sometimes are thrown over backwards if the load slips or is dropped especially under side-lift conditions. In this instance the boom snapback is only indirectly responsible for the overturning of the crane, but properly snubbed, the boom reaction would be harmless.

Boom Stops and Controls

Many of the accidents described above can be prevented by the installation of one of several types of boom stops to the rig as shown in

(Continued on page 168)

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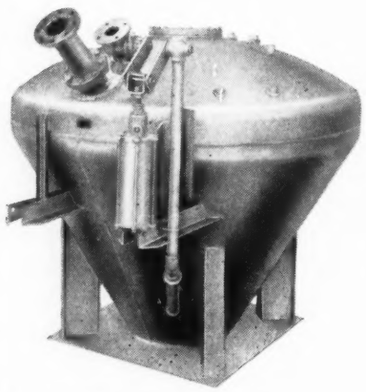

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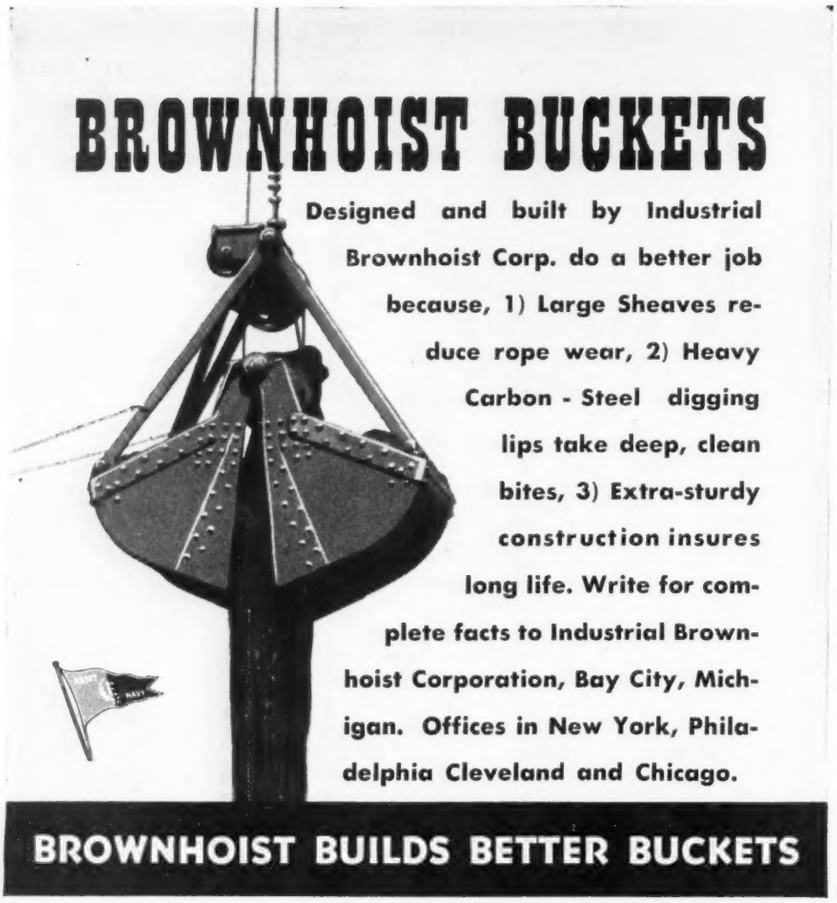
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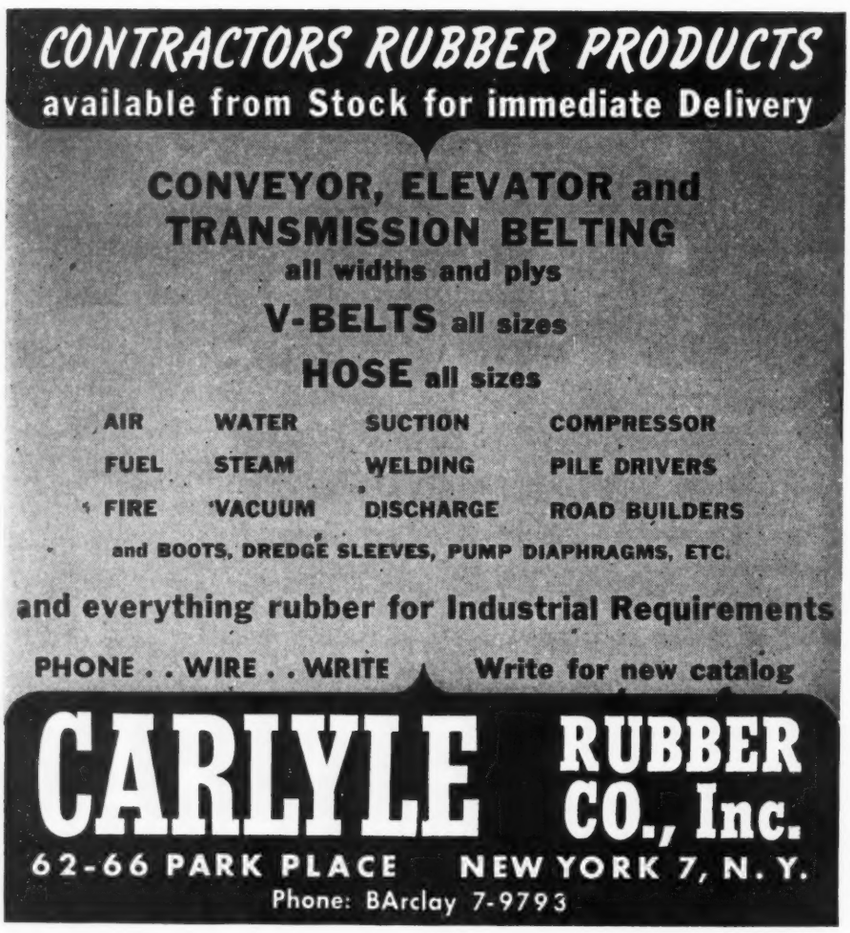
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(Continued from page 166)

the accompanying illustrations. Such devices are standard equipment on some machines, on others they can be installed on the job.

Simplest of all stops is a cable snub connecting the rotating base casting near the boom hinge with the bottom side of the boom frame 15 or 20 ft. from the hinges, depending upon the length of boom. This type of stop, while inexpensive, easily installed and requiring no maintenance, is fully effective only when the boom is rising slowly. If the boom is traveling fast when the snubber takes effect, either the stop cables snap or the boom bends at the point of restraint. An analysis of stresses shows that to resist the pull of the multiple-boom hoist lines, the snub cables would have to be from 12 to 24 times as heavy as the boom lines, an impractical installation. Besides, if the tops were sufficiently strong to break the boom hoist line, the inevitable dropping of the boom would probably be a greater disaster than that which the stops were designed to prevent.

If the cables do break under the emergency and the operator is able to cut the boom drive power, the cost of replacing the cables would be cheap insurance. However, it is unlikely that the operator, once permitting the boom to get beyond the point of snapping the restraining cables, would think and act fast enough to kick out the boom drive and prevent further damage. If the cable stop is installed so as to bend the boom, there is more likelihood of serious crane damage being prevented for, in all probability, as the boom is bent more and more, either the crane engine will stall or the operator, having more time available, will be successful in releasing power from the boom drive.

Stop Devices

Stop devices employing the principles of limit switches, which disconnect the clutches or stop the engine when the boom reaches a predetermined maximum angle, are more desirable than cable stops in some ways, yet less desirable in others. These devices, operated electrically, mechanically, hydraulically or pneumatically, cost more to install, but their successful operation causes no damage to the boom or other part of the crane. Yet they are ineffective in preventing boom accidents due to "two-blocking," boom-drive clutch drag, parting of a sling or some of the other causes already described. Actually, they are of real value only

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in cases of careless operation in which failure to disengage the boom-drive clutch is the primary cause of the accident.

The most effective application of the limit switch is to rig it up so that the master clutch is disengaged rather than the boom drive clutch. Thus, possible accidents due to dragging boom-drive clutches and "two-blocking" will also be eliminated. However, it would still be possible for a dragging master clutch to render limit switches connected to the master clutch ineffective. Some limit switch devices are rigged so as to kill the engine. If the power is a gasoline engine, breaking the ignition system circuit on the primary side is effective. Throttling the carburetor would be double insurance, for some engines when hot continue to run for a few moments after the ignition is shut off.

Diesel engines are effectively killed by simple release of the cylinder compression. A system of this type would be an effective stop for all types of boom accidents caused by boom or hoist line pull, but would

(Continued on page 170)

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(Continued from page 169)

be useless in preventing accidents due to parted slings, tipped barges, etc.

All that is necessary for an electrical system of this type are a limit switch, a solenoid circuit breaker, the necessary leads and simple, but sturdy, brackets for the mounting of the limit switch and solenoid. The alternate hydraulic system is simple, being made up of a master cylinder and piston, an actuator cylinder and piston, in which the piston is connected to the master clutch or ignition circuit breaker, the necessary tubing and oil reservoir to take care of minute leakage in the system.

Pneumatic System

Another alternate is a pneumatic system, consisting of an operating valve, normally closed, and open only when the boom has exceeded its proper angle; a check valve to prevent loss of vacuum during periods of shut-down or high engine load; a vacuum booster which furnishes the power to release the master clutch, etc., when the operating valve opens, and a bleeder

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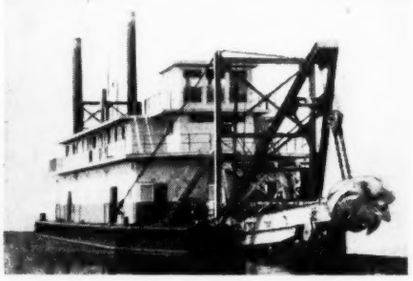

valve operated by a foot pedal. This valve permits the clutch to be engaged again, after having been automatically disengaged, by allowing air to enter the system and destroy the vacuum.

All three systems can be, and have been, made to work well. The pneumatic system is actually simpler in operation than it appears. Any one of these boom stop systems when purchased complete, ready for installation, might appear to be too expensive, considering the cost of the parts furnished, but they are really cheap insurance against accidents due to careless operation.

The best type of boom stop is one that combines the two functions of disengaging the master clutch or killing the engine, and physically stopping the boom as it reaches the desired maximum angle. A plunger-type bumper meets these requirements, but is the most expensive and complex of all such devices. However, it will prevent practically all types of boom accidents, and therefore its installation is justified on rigs handled by inexperienced operators. This type of stop is a combination piston and cylinder, either spring or pneumatically

(Continued on page 172)

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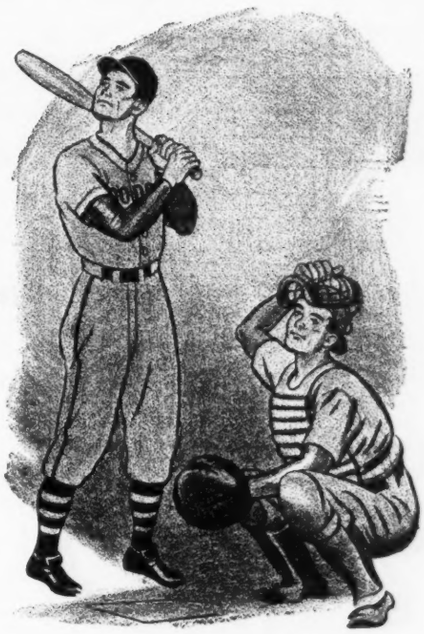

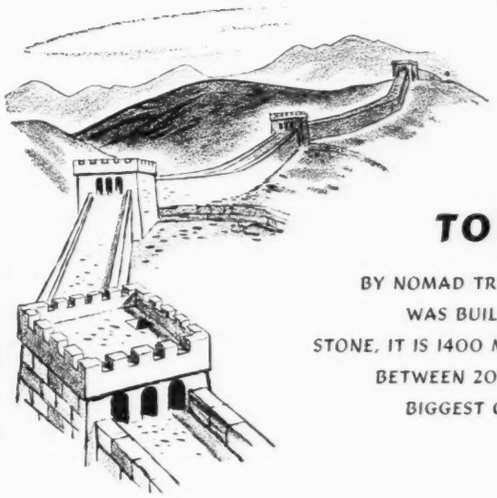

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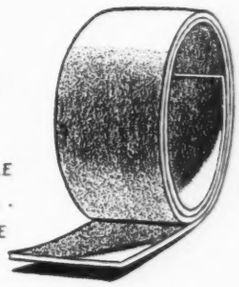

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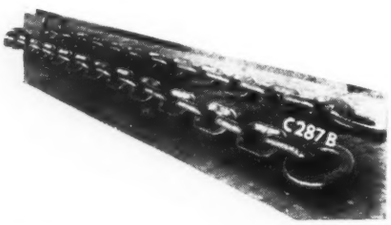

C287B — Manganese steel dragline bucket pulling chains (U. S. Patent 2,103,972).

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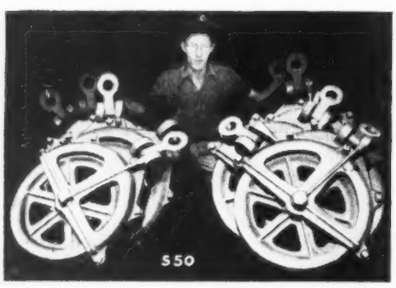

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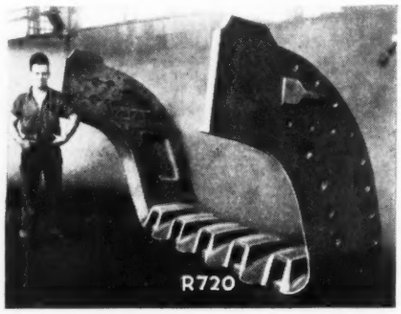

R720—Manganese steel lip for 20-yard dragline bucket.

Amsco manganese steel castings as made for leading builders of draglines and shovels are described in Bulletin 641-S.

(Amsco Manganese Steel Castings are produced and sold in Canada by Joliette Steel Ltd., Joliette, Quebec.)

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(Continued from page 171)

actuated, and mounted on the A-frame or gantry to intercept the boom as high above the boom hinge as possible. By positive displacement of an actuator mounted on the A-frame, the boom action disengages the master clutch or kills the engine. The simplest scheme is to connect the actuator and clutch (or ignition breaker, or compression release) by a light cable reeved over a few small sheaves.

Installation a Matter of Economics

Whether boom stops should be installed is, of course, a matter of economics, involving value of the rig, cost of repairs, experience of available operators, prevailing weather at job site, type of work to be done, and cost of insurance, all weighed against the cost of the desirable type of stop device. Boom stops are insurance against certain types of crane accidents. However, every accident is expensive, even overlooking the humanitarian aspects of injuring an employee, and a careful analysis of the value of boom stops will usually result in their acceptance.

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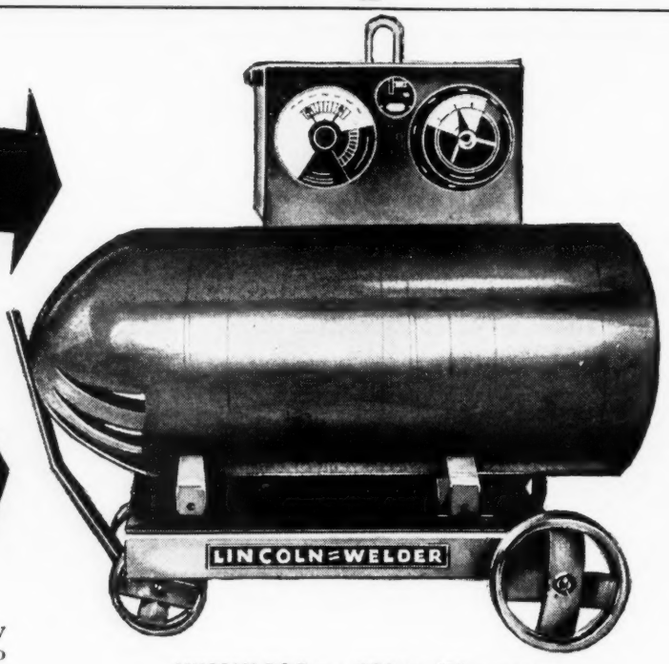

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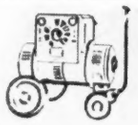
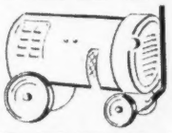
ALL ITEMS SUBJECT TO PRIOR SALE



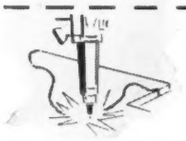
HOBART
Standard models of this make available in large quantities and most ratings.



WESTINGHOUSE
Portable models available in limited quantities.

RESISTANCE WELDERS
Spot, seam, butt and flash type welders for production operations—also portable or gun types.

WELD POSITIONERS
Many sizes and capacities, including head and tailstock combinations.



FLAME CUTTERS
Both single and multiple torch types, portable and stationary.

FREE FACTS

TO WAR ASSETS ADMINISTRATION:
Please send me information on availability, condition and location of the following types of equipment:

- ☐ *HOBART ARC WELDERS*
- ☐ *LINCOLN ARC WELDERS*
- ☐ *WESTINGHOUSE ARC WELDERS*
- ☐ *.....ARC WELDERS*
- ☐ *.....* (other equipment)
- ☐ *RESISTANCE WELDERS (spot) (seam) (flash)*
- ☐ *FLAME CUTTERS*
- ☐ *WELD POSITIONERS (capacity).....*
- ☐ *WELDING ROD OR ELECTRODES*

Name.....

Firm.....

Address.....

City.....*State*.....

176-1

VETERANS OF WORLD WAR II

To help you in purchasing surplus property, veterans' units have been established in each War Assets Administration Regional Office.

WAR ASSETS ADMINISTRATION

OFFICES LISTED BELOW ARE TEMPORARILY IN RECONSTRUCTION FINANCE CORPORATION AGENCIES

Offices located at: Atlanta · Birmingham · Boston · Charlotte · Chicago · Cleveland · Dallas · Denver Detroit · Helena · Houston · Jacksonville · Kansas City, Mo. · Little Rock · Los Angeles · Louisville Minneapolis · Nashville · New Orleans · New York · Oklahoma City · Omaha · Philadelphia Portland, Ore. · Richmond · St. Louis · Salt Lake City · San Antonio · San Francisco · Seattle · Spokane Cincinnati · Fort Worth (Telephone 3-5381)

176-1

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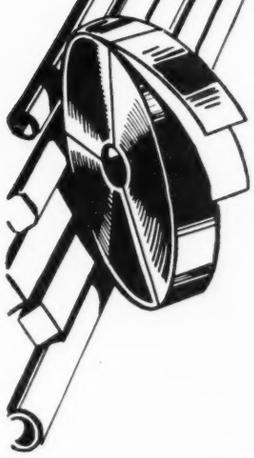

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in many standard and non-standard grades, finishes, sizes and specifications AVAILABLE NOW in production quantities

—and new surplus declarations are being made daily.

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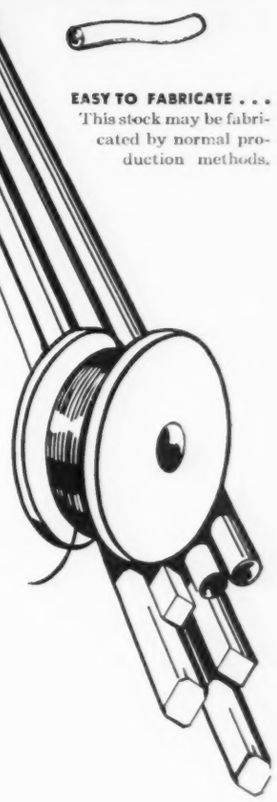

HOW TO PURCHASE

1. Estimate, for any convenient period, your production needs in each specification, finish, gauge, etc.
2. Write, wire or phone that information to your nearest War Assets Corporation office* below. We will advise you of the location and condition of the stock you need, estimate possible delivery dates, quote prices and help arrange credit.
3. When satisfactory arrangements have been made, we will start shipments.

*WAR ASSETS CORPORATION is a Reconstruction Finance Corporation subsidiary. When checking telephone and other directories, simply look up RFC.

VETERANS OF WORLD WAR II: To help you in purchasing surplus property from War Assets Corporation, a veterans' unit has been established in each of our Regional Offices listed below.

WAR ASSETS ADMINISTRATION

OFFICES LISTED BELOW ARE TEMPORARILY IN RECONSTRUCTION FINANCE CORPORATION AGENCIES

Offices located at: Atlanta · Birmingham · Boston · Charlotte · Chicago · Cleveland · Dallas · Denver Detroit · Helena · Houston · Jacksonville · Kansas City, Mo. · Little Rock · Los Angeles · Louisville Minneapolis · Nashville · New Orleans · New York · Oklahoma City · Omaha · Philadelphia Portland, Ore. · Richmond · St. Louis · Salt Lake City · San Antonio · San Francisco · Seattle · Spokane Cincinnati · Fort Worth (Telephone 3-5381)

157-4

SEARCHLIGHT SECTION

(Additional Searchlight Ads on Pages 174 & 175)

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6″ O.D.... 12 Gauge

20′ Lengths with Quick Couplings

War surplus material available for immediate delivery.

Suitable for permanent or temporary, high or low pressure lines.

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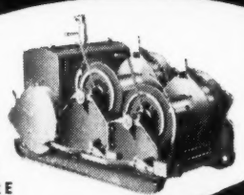

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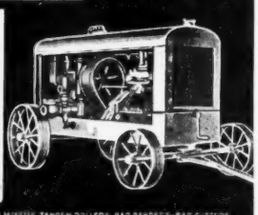

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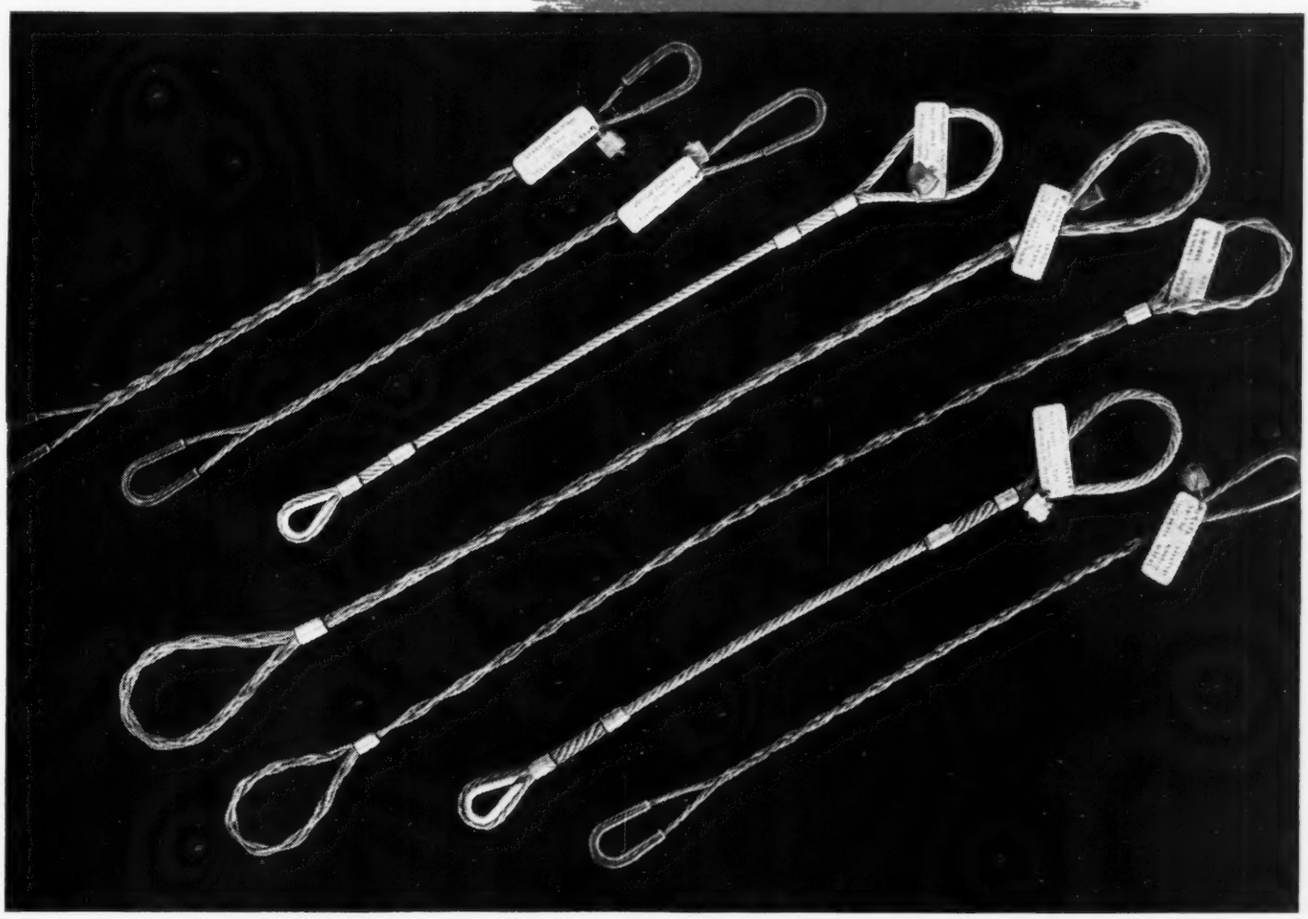

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